



**UNIVERSITY OF TRAVANCORE**

**CALENDAR**  
**FOR**  
**1942-1943**



TRIVANDRUM :

PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS

1942





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## THE COAT OF ARMS



JUNE—1942.

[Edavam—Mithunam 1117 M. E.

Malabar Date.	Day	Description of holidays, remarks etc.
19	Mon.	Corpus Christi (Holiday).
20	Tues.	
21	Wed.	
22	Thurs.	
23	Fri.	
24	Satur.	
25	Sun.	Re-opening of the Colleges maintained by the University.
26	Mon.	
27	Tues.	
28	Wed.	H. M. The King Emperor's Birthday.
29	Thurs.	
30	Fri.	
31	Satur.	
32	Sun	
1	Mon.	
2	Tues.	
3	Wed.	
4	Thurs.	
5	Fri.	
6	Satur.	
7	Sun.	
8	Mon.	
9	Tues.	
10	Wed.	
11	Thurs.	
12	Fri.	
13	Satur.	
14	Sun.	
15	Mon.	
16	Tues.	

JULY—1942.

Mithunam—Karkadagam 1117 M. E.

Eng. Date.	Malabar Date.	Day.	Description of holidays, remarks, etc.
1	17	Wed.	
2	18	Thurs.	
3	19	Fri.	
4	20	Satur.	
5	21	Sun.	
6	22	Mon.	
7	23	Tues.	
8	24	Wed.	
9	25	Thurs.	
10	26	Fri.	
11	27	Satur.	
12	28	Sun.	
13	29	Mon.	Meeting of the Syndicate.
14	30	Tues.	
15	31	Wed.	Annual meeting of the Senate. Last day of registration for the Intermediate Examination, September 1942.
16	32	Thurs.	Dakshinayanapunnakalam (Holiday)
17	1	Fri.	
18	2	Satur.	
19	3	Sun.	
20	4	Mon.	
21	5	Tues.	
22	6	Wed.	Last day for the receipt of half yearly returns of staff from Colleges as on 15th July 1942.
23	7	Thurs.	
24	8	Fri.	
25	9	Satur.	
26	10	Sun.	
27	11	Mon.	
28	12	Tues.	
29	13	Wed.	
30	14	Thurs.	
31	15	Fri.	

## AUGUST—1942.

Karkadagam 1117—Chingam 1118 M.E.

Eng. Date.	Malabar Date.	Day.	Description of Holidays, Remarks, etc.
1	16	Satur.	
2	17	Sun.	
3	18	Mon.	
4	19	Tues.	
5	20	Wed.	
6	21	Thurs.	
7	22	Fri.	
8	23	Satur.	
9	24	Sun.	
10	25	Mon.	Vavu Orikkal. Holiday.
11	26	Tues.	Karkataka Vavu. Holiday.
12	27	Wed.	
13	28	Thurs.	
14	29	Fri.	
15	30	Satur.	
16	31	Sun.	Avani Pirappu. Holiday.
17	1	Mon.	Last day for receiving attendance certificates for the
18	2	Tues.	Inter. Examination, September 1942.
19	3	Wed.	
20	4	Thurs.	
21	5	Fri.	
22	6	Satur.	
23	7	Sun.	First Onam. Holiday.
24	8	Mon.	Onam Holidays begin.
25	9	Tues.	Third Onam. Holiday.
26	10	Wed.	Fourth Onam. do.
27	11	Thurs.	Fifth Onam. do.
28	12	Fri.	
29	13	Satur.	
30	14	Sun.	
31	15	Mon.	



**SEPTEMBER 1942.**  
**Chingam—Kanni 1118 M. E.**

Eng. Date.	Malabar Date.	Day.	Description of holidays, remarks, etc.
1	16	Tues.	Intermediate Examination commences.
2	17	Wed.	Ashtami Rohini. Holiday
3	18	Thurs.	
4	19	Fri.	
5	20	Satur.	
6	21	Sun.	
7	22	Mon.	Colleges re-open after Onam holidays.
8	23	Tues.	
9	24	Wed.	
10	25	Thurs.	
11	26	Fri.	
12	27	Satur.	
13	28	Sun.	
14	29	Mon.	Vinayaka chathurthi. Holiday.
15	30	Tues.	
16	31	Wed.	
17	1	Thurs.	
18	2	Fri.	
19	3	Satur.	Meeting of the Syndicate.
20	4	Sun.	
21	5	Mon.	Sri Narayana Guru Samadhi Day Holiday.
22	6	Tues.	
23	7	Wed.	
24	8	Thurs.	
25	9	Fri.	
26	10	Satur.	
27	11	Sun.	
28	12	Mon.	
29	13	Tues.	
30	14	Wed.	

**OCTOBER—1942.**  
**Kanni—Thulam 1118. M. E.**

Eng. Date.	Malabar Date.	Day.	Description of holidays, remarks, etc.
1	15	Thurs.	
2	16	Fri.	
3	17	Satur.	
4	18	Sun.	
5	19	Mon.	
6	20	Tues.	
7	21	Wed.	
8	22	Thurs.	
9	23	Fri.	Mahalaya Amavasi Holiday.
10	24	Satur.	
11	25	Sun.	
12	26	Mon.	Ramzan. Holiday
13	27	Tues.	
14	28	Wed.	
15	29	Thurs.	
16	30	Fri.	
17	1	Satur.	Durgashtami. Holiday.
18	2	Sun.	Mahanavami do.
19	3	Mon.	Vijayadasami do.
20	4	Tues.	
21	5	Wed.	
22	6	Thurs.	
23	7	Fri.	
24	8	Satur.	
25	9	Sun.	
26	10	Mon.	
27	11	Tues.	
28	12	Wed.	
29	13	Thurs.	
30	14	Fri.	
31	15	Satur.	

NOVEMBER - 1942.

Thulam—Vrischigam 1118 M. E.

Eng. Date.	Malabar Date.	Day.	Description of holidays, remarks, etc.
1	16	Sun.	The Travancore University Act passed by H. H. The Maharaja and the University incorporated (1937).
2	17	Mon.	
3	18	Tues.	
4	19	Wed.	
5	20	Thurs.	Fourth Annual Convocation
6	21	Fri.	Kariku Vettu. Holiday
7	22	Satur.	H. H. The Maharaja's birthday. Holiday Deepavali.
8	23	Sun.	
9	24	Mon.	
10	25	Tues.	
11	26	Wed.	
12	27	Thurs.	Temple Entry Proclamation Day. Holiday
13	28	Fri.	
14	29	Satur.	Arat at Trivandrum. Holiday
15	30	Sun.	
16	1	Mon.	
17	2	Tues.	
18	3	Wed.	
19	4	Thurs.	
20	5	Fri.	
21	6	Satur.	Meeting of the Syndicate.
22	7	Sun.	
23	8	Mon.	Trikkarthika. Holiday
24	9	Tues.	
25	10	Wed.	
26	11	Thurs.	
27	12	Fri.	
28	13	Satur.	
29	14	Sun.	
30	15	Mon.	

**DECEMBER -1942.**  
**Vrischigam—Dhanu 1118 M. E.**

Eng. date.	Malabar Date.	Day	Description of holidays, remarks etc.
1	16	Tues.	
2	17	Wed.	
3	18	Thurs.	
4	19	Fri.	
5	20	Satur.	
6	21	Sun.	
7	22	Mon.	
8	23	Tues.	
9	24	Wed.	
10	25	Thurs.	
11	26	Fri.	
12	27	Satur.	
13	28	Sun.	
14	29	Mon.	
15	30	Tues.	
16	1	Wed.	
17	2	Thurs.	
18	3	Fri.	Swargavathil Ekadasi. Holiday.
19	4	Satur.	Bakrid. Holiday.
20	5	Sun.	
21	6	Mon.	Christmas Holidays begin.
22	7	Tues.	
23	8	Wed.	
24	9	Thurs.	
25	10	Fri.	Christmas.
26	11	Satur.	
27	12	Sun.	
28	13	Mon.	
29	14	Tues.	
30	15	Wed.	
31	16	Thurs.	

**JANUARY—1943.**  
**Dhanu—Makaram 1118 M. E.**

Eng. Date.	Malabar Date.	Day.	Description of holidays, remarks, etc.
1	17	Fri.	New year's day. Holiday.
2	18	Satur.	
3	19	Sun.	
4	20	Mon.	Colleges reopen after the Christmas holidays.
5	21	Tues.	
6	22	Wed.	
7	23	Thurs.	Christmas (E) Holiday.
8	24	Fri.	
9	25	Satur.	
10	26	Sun.	Last day of registration for the University Examinations. March 1943.
11	27	Mon.	
12	28	Tues.	
13	29	Wed.	
14	1	Thurs.	Uttarayana Punniakalam. Holiday.
15	2	Fri.	
16	3	Satur.	
17	4	Sun.	
18	5	Mon.	
19	6	Tues.	
20	7	Wed.	
21	8	Thurs.	
22	9	Fri.	Last day for the receipt of returns of staff from Colleges as on 15th January 1943.
23	10	Satur.	Meeting of the Syndicate.
24	11	Sun.	
25	12	Mon.	
26	13	Tues.	
27	14	Wed.	
28	15	Thurs.	
29	16	Fri.	
30	17	Satur.	
31	18	Sun.	

FEBRUARY—1943.

Makaram -Kumbham 1118 M. E.

Malabar date.	Day.	Description of Holidays, Remarks etc.
19	Mon.	
20	Tues.	
21	Wed.	Vavu Orikkal. Holiday.
22	Thurs.	Makaravayu do.
23	Fri.	
24	Satur.	
25	Sun.	
26	Mon.	
27	Tues.	
28	Wed.	
29	Thurs.	
30	Fri.	
1	Satur.	
2	Sun.	
3	Mon.	
4	Tues.	
5	Wed.	
6	Thurs.	
7	Fri.	
8	Satur.	
9	Sun.	
10	Mon.	
11	Tues.	
12	Wed.	
13	Thurs.	
14	Fri.	
15	Satur.	Last day for the receipt of attendance certificates.
16	Sun.	

MARCH—1943.  
Kumbham—Meenam 1118 M. E.

Eng. date.	Malabar Date.	Day	Description of Holidays, Remarks etc.
1	17	Mon.	
2	18	Tues.	
3	19	Wed.	
4	20	Thurs.	Sivaratri. Holiday
5	21	Fri.	
6	22	Satur.	
7	23	Sun.	
8	24	Mon.	All University Examinations (except Law and Engineering) Commence.
9	25	Tues	
10	26	Wed.	
11	27	Thurs.	
12	28	Fri.	
13	29	Satur.	Meeting of the Syndicate.
14	1	Sun.	
15	2	Mon.	F. L. and B. L. Examinations commence.
16	3	Tues.	
17	4	Wed.	
18	5	Thurs.	
19	6	Fri.	
20	7	Satur.	
21	8	Sun.	
22	9	Mon.	
23	10	Tues.	
24	11	Wed.	
25	12	Thurs.	
26	13	Fri.	
27	14	Satur.	
28	15	Sun.	
29	16	Mon.	
30	17	Tues.	
31	18	Wed.	

APRIL—1943.  
Meenam—Medam 1118 M. E.

Eng. date.	Malabar date.	Day	Description of Holidays, Remarks etc.
1	19	Thurs.	Engineering Examinations commence.
2	20	Fri.	
3	21	Satur.	
4	22	Sup.	
5	23	Mon.	
6	24	Tues.	
7	25	Wed.	
8	26	Thurs.	
9	27	Fri.	
10	28	Satur.	
11	29	Sun.	Vishu. Holiday
12	30	Mon.	
13	31	Tues.	
14	1	Wed.	
15	2	Thurs.	
16	3	Fri.	
17	4	Satur.	
18	5	Sun.	
19	6	Mon.	
20	7	Tues.	
21	8	Wed.	
22	9	Thurs.	
23	10	Fri.	
24	11	Satur.	
25	12	Sun.	
26	13	Mon.	
27	14	Tues.	
28	15	Wed.	
29	16	Thurs.	
30	17	Fri.	



MAY—1943.  
Medam—Edavam 1118. M. E.

Eng. Date.	Malabar Date.	Day	Description of Holidays, Remarks etc.
1	18	Satur.	
2	19	Sun.	
3	20	Mon.	
4	21	Tues.	
5	22	Wed.	
6	23	Thurs.	
7	24	Fri.	
8	25	Satur.	Meeting of the Syndicate.
9	26	Sun.	
10	27	Mon.	
11	28	Tues.	
12	29	Wed.	
13	30	Thurs.	
14	31	Fri.	
15	1	Satur.	
16	2	Sun.	
17	3	Mon.	
18	4	Tues.	
19	5	Wed.	
20	6	Thurs.	
21	7	Fri.	
22	8	Satur.	
23	9	Sun.	
24	10	Mon.	
25	11	Tues.	
26	12	Wed.	
27	13	Thurs.	
28	14	Fri.	
29	15	Satur.	
30	16	Sun.	
31	17	Mon.	

UNIVERSITY OF TRAVANCORE.

*Chancellor*

HIS HIGHNESS SIR BALA RAMA VARMA, G. C. I. E.,

D. Litt.

MAHARAJA OF TRAVANCORE

*Pro-Chancellor*

Her Highness Maharani Setu Parvati Bayi

of Travancore, D. Litt.

*Vice-Chancellor*

Sachivottama Sir C. P. Ramaswami Aiyar, K. C. S. I., K. C. I. E.,

LL. D.

Dewan of Travancore

*Pro-Vice-Chancellor*

Mr. C. V. Chandrasekharan, M. A.

*Registrar*

Mr. P. R. Parameswara Panikkar, M. A.

SENATE.

CLASS I—EX-OFFICIO MEMBERS.

- 1 Sachivottama Sir C. P. Ramaswami Aiyar, K. C. S. I., K. C. I. E., LL. D., Vice-Chancellor.
- 2 M. R. Ry. C. V. Chandrasekharan Ayl., M. A., Pro-Vice-Chancellor.
- 3 „ A. Gopala Menon Ayl., M. A., B. Com. Director of Public Instruction Travancore, Trivandrum.

DEANS OF FACULTIES.

- 4 Dr. K. L. Moudgill, M. A., D. Sc., F. I. C. Dean of the Faculty of Science.
- 5 T. H. Matthewman Esq., M. Eng., M. I. E. E., Dean of the Faculty of Technology.
- 6 M. R. Ry. K. P. Padmanabha Pillai Ayl., B. A., LL. B., Bar-at-Law, Dean of the Faculty of Law.
- 7 „ Vacant.
- 8 Dr. D. Jivanayakom, M. A., L. T., Ph. D., Dean of the Faculty of Education.
- 9 M. R. Ry. Rao Sahib Mahakavi Sahithyabhushana Ulloor S. Parameswara Aiyar Ayl., M. A., B. L., Dean of the Faculty of Oriental Studies and Fine Arts.

PRINCIPALS OF COLLEGES.

- 10 „ V. M. Ittyerah Ayl., M. A., B. Litt, Principal, Union Christian College, Alwaye.
- 11 Rev. Fr. I. C. Romeo Thomas, T. O. C. D., M. A., L. T., Principal, St. Berchmans' College, Changanacherry.
- 12 Dr. H. Subramonia Aiyar M. A. Ph. D., Acting Principal, H. H. The Maharaja's University College, Trivandrum.
- 13 Miss Anna Nidiri, M. A., Acting Lady Principal, College for Women, Trivandrum.
- 14 M. R. Ry. N. Gopala Pillai Ayl., M. A., Acting Principal, Sanskrit College, Trivandrum.
- 15 „ N. K. Padmanabha Pillai Ayl., F. R. S. A., Principal, Institute of Textile Technology.
- 16 M. R. Ry. P. C. Joseph Ayl., M. A., Principal, C. M. S. College, Kottayam.
- 17 G. H. Marsden, Esq., M. A., Principal, Scott Christian College, Nagercoil.

MEMBERS OF THE SYNDICATE NOT OTHERWISE A MEMBER OF THE SENATE.

- 18 M. R. Ry., C. O. Madhavan Ayl., B. A., B. L., Retired Chief Secretary to Government, Trivandrum.
- 19 „ R. Srinivasan Ayl., M. A., Acting Principal, College of Science, Trivandrum (On leave.)

OTHER EX-OFFICIO MEMBERS.

- 20 „ Joseph Thaliath Ayl., M. A., Bar-at-Law, Chief Justice, Travancore High Court, Trivandrum.
- 21 „ Rajyasevaprayina G. Parameswaran Pillai Ayl., B. A., B. L., Chief Secretary to Government, Trivandrum.
- 22 „ A. Lakshminarayana Iyer Ayl., B. A., Financial Secretary to Government, Trivandrum.
- 23 „ Rajyasevaprayina U. Padmanabha Kukillaya Ayl., M. A., B. L., Advocate-General, Trivandrum.
- 24 „ J. W. Chacko Ayl., Chief Engineer Workshops and War Industries Trivandrum.
- 25 „ P. R. Parameswara Panikkar Ayl., M. A., Registrar, University of Travancore.

CLASS II—ELECTED MEMBERS.  
THREE YEARS FROM THE 9TH DECEMBER 1940.  
BY REGISTERED GRADUATES.

- 26 Dr. T. K. Koshy, M. A., Ph. D., F. R. M. S., F. L. S. Professor, H. H. The Maharaja's University College, Trivandrum.
- 27 M. R. Ry. K. M. Mathew, Avl., B. A., L. T., Assistant Superintendent, Department of Publications.
- 28 „ Kottur Kunjukrishna Pillai Avl., B. A., B. L., Second and Additional Sessions Judge, Nagercoil.
- 29 Mrs. Annamma Varki B. A., (Hons.) Assistant Professor, H. H. The Maharaja's University College, Trivandrum.
- 30 M. R. Ry. P. S. Sivaswami Aiyar Avl., B. A., L. T., Division Inspector of Schools, Trivandrum.
- 31 „ K. Sankara Pillai Avl., B. A., (Retired Superintendent of Studies in Indian Languages, St. Berchmans' College, Changanacherry,) Asariathu House, Pela Muri, Onattukara, Mavelikara.
- 32 „ K. Sankaranarayana Aiyar, Avl., M. A., L. T., Lecturer, Training College, Trivandrum.

BY THE SRI MULAM ASSEMBLY.

- 33 „ K. G. Kunjukrishna Pillai Avl., B. A., B. L., Member, Sri Mulam Assembly, Government Pleader, Trivandrum.
- 34 M. R. Ry. K. Dominic Joseph Avl., B. A., B. L., Member, Sri Mulam Assembly, Advocate, Kottayam.
- 35 Srimathy T. Narayani Amma, B. A., Member, Sri Mulam Assembly, Vadayar House, Chalai, Trivandrum.

BY THE SRI CHITRA STATE COUNCIL.

- 36 M. R. Ry. Kochikal P. Balakrishnan Tampi, Avl., B. A. B. L., Member, Sri Chitra State Council, Advocate, Trivandrum.
- 37 „ N. Krishna Aiyar Avl., M. A., B. L., Member, Sri Chitra State Council, Advocate, 'Brindavan', Kottayam.

BY THE TEACHING STAFF OF THE PRIVATE (First Grade) COLLEGES.

- 38 M. R. Ry. T. R. Anantaraman Avl., B. A., Lecturer in Chemistry, Union Christian College, Alwaye.
- 39 „ L. M. Pylee Avl., M. A., B. L., Additional Professor of History and Economics, St. Berchmans' College, Changanacherry.

BY THE FACULTIES.

- 40 M. R. Ry. N. Kunjuraman Pillai Avl., M. A., B. L., Lecturer, H. H. The Maharaja's University College, Trivandrum.
- 41 „ Kayalam Parameswaran Pillai Avl., B. A., B. L. Member, Faculty of Law, Advocate, Trivandrum.
- 42 „ T. Jacob Poonen Avl., B. A., Member, Faculty of Arts, Retired Vice-Principal, C. M. S. College, Kottayam.
- 43 „ M. S. Raghavachari Avl., M. A., Member, Faculty of Science, Professor, St. Berchmans' College, Changanacherry.
- 44 „ K. P. Krishna Menon Avl., B. A., L. T., General Manager and Inspector of N. S. S. Schools, Changanacherry.

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- 45 Captain V. Padmanabhan Tampy, "Bellehaven", Trivandrum.
- 46 M. R. Ry. A. V. Thomas Avl., Beach Road, Alleppey.

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FOR THREE YEARS FROM THE 9TH DECEMBER 1940.

- 47 M. R. Ry. K. Balasubramonia Aiyar Avl., B. A., B. L., Advocate, Madras.
- 48 Dr. Jayaram Cousins, Head of the Department of Fine Arts, University of Travancore.

- 49 M. R. Ry. Rao Bahadur K. V. Krishnaswami Aiyar Avl., B. A., B. L., Advocate, 6, North Mada Street, Mylapore, Madras.
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- 51 „ P. J. Thomas Avl., M. A., B. Litt., D. Phil., M. L. C., University Professor of Indian Economics, University Buildings, Chepauk, Triplicane, Madras.
- 52 „ T. R. Venkatarama Sastri Avl., C. I. E., B. A., B. L., 'Kaustuba,' Edward Elliot Road, Mylapore, Madras.
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- 54 Rev Fr. Patrick, O. C. D., Headmaster, St. Joseph's English High School, Trivandrum.
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- 57 M. R. Ry. Malloor K. Govinda Pillai Avl., B. A., B. L., Advocate, Retired Principal, Law College, Trivandrum.
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- 59 M. R. Ry. C. C. John Avl., M. A., D. Sc., D. I. C., Professor of Marine Biology and Fisheries, University of Travancore, Trivandrum.
- 60 „ S. Krishna Aiyar, Avl., B. A., B. L., Advocate, 'Haripad Matom' Kottayam, N. Travancore.
- 61 „ C. Kumara Das, Avl., M. A., M. Sc., F. I. C., Acting Secretary to Government, Trivandrum.
- 62 „ K. R. Narayana Aiyar Avl., B. A., M. Sc., F. C. S., Director of Agriculture, Travancore, Trivandrum.
- 63 „ Kainikkara M. Padmanabha Pillai Avl., B. A. L. T., M. L. A. Changanacherry, N. Travancore.
- 64 „ J. E. A. Pereira Avl., M. L. A., 'Gitanjali' Quilon, Travancore.
- 65 Khan Bahadur Rajyasevapravina G. Saiyid Abdul Karim Sahib Suhrawardy, M. B. E., Inspector-General of Police, Travancore, Trivandrum.

FROM 11-11-1941.

- 66 „ K. P. P. Menon Avl., B. A., B. Sc., (Hons.), D. I. C., M. I. E. E. M. I. Mech. E., M. I. E., Electrical Engineer to Government, Trivandrum.

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- 3 „ A. Gopala Menon, Avl., M. A., B. com. Director of Public Instruction, Travancore.

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MEMBERS ELECTED FROM AND BY THE SENATE UNDER SECTION 16 (v) OF  
ACT I OF 1113.

THREE YEARS FROM THE 27TH JUNE 1940.

- 6 M. R. Ry. Kainikkara M. Padmanabha Pillai, Avl., B. A., L. T., Member,  
Sri Mulam Assembly, Changanacherry.
- 7 „ Malloor K. Govinda Pillai, Avl., B. A., B. L., Retired Principal, Law  
College, Trivandrum.

MEMBERS NOMINATED BY THE CHANCELLOR UNDER SECTION 16 (vi) OF  
ACT I OF 1113.

THREE YEARS FROM THE 27TH JUNE 1940.

- 8 Dr. K. L. Moudgill, M. A., D. Sc., F. I. C. Dean, Faculty of Science.
- 9 T. H. Matthewman Esq., M. Eng., M. I. E. E., Dean, Faculty of Technology.
- 10 M. R. Ry. K. P. Padmanabha Pillai Avl., B. A., LL. B., Bar-at-Law, Dean  
Faculty of Law.
- 11 „ C. O. Madhavan Avl., B. A., B. L. Retired Chief Secretary to Govern-  
ment Trivandrum.

THREE YEARS FROM 22ND JUNE 1941.

- 12 „ R. Srinivasan Avl., M. A., Ag. Principal, College of Science, Trivan-  
drum (On leave).

STANDING COMMITTEES OF THE SYNDICATE.

(i) STAFF, EQUIPMENT AND BUILDINGS.

- (1) Dr. K. L. Moudgill—(Convener)
- (2) Mr. A. Gopala Menon
- (3) „ R. Srinivasan
- (4) „ T. H. Matthewman.

(ii) RESIDENCE, WELFARE AND DISCIPLINE OF STUDENTS.

- (1) Mr. K. P. Padmanabha Pillai (Convener)
- (2) „ V. M. Ittyerah
- (3) „ C. O. Madhavan
- (4) Dr. K. L. Moudgill
- (5) Mr. Malloor K. Govinda Pillai
- (6) Mr. R. Srinivasan.

(iii) PUBLICATION AND RESEARCH.

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- (2) „ Malloor K. Govinda Pillai
- (3) „ Kainikkara M. Padmanabha Pillai
- (4) „ T. H. Matthewman
- (5) Dr. K. L. Moudgill.

(iv) RECOGNITION AND EXEMPTION.

- (1) Dr. K. L. Moudgill (Convener)
- (2) Rev. Fr. Romeo Thomas
- (3) Mr. Kainikkara M. Padmanabha Pillai
- (4) Mr. A. Gopala Menon
- (5) „ K. P. Padmanabha Pillai
- (6) „ R. Srinivasan.

(v) EXAMINATIONS.

- (1) Mr. K. P. Padmanabha Pillai (Convener)
- (2) „ A. Gopala Menon
- (3) „ V. M. Ittyerah
- (4) Dr. K. L. Moudgill
- (5) Mr. R. Srinivasan.

## DEANS OF FACULTIES.

- |   |  |  |
|---|--|--|
| 1 | Dean of the Faculty of Arts                            | Vacant.  |
| 2 | Dean of the Faculty of Science                         | Dr. K. L. Moudgill, M. A., D. Sc., F. I. C. Director of Research, University of Travancore, Trivandrum.                        |
| 3 | Dean of the Faculty of Oriental Studies and Fine Arts. | M. R. Ry. Rao Sahib Mahakavi Sahityabhushana Ujjur S. Parameswara Aiyar Avl., M. A., B. L. Retired Dewan Peishkar, Trivandrum. |
| 4 | Dean of the Faculty of Law.                            | K. P. Padmanabha Pillai, Esq., B. A., LL. B., Bar-at-Law, Principal, H. H. the Maharaja's Law College, Trivandrum.             |
| 5 | Dean of the Faculty of Education.                      | Dr. D. Jivanayakom M. A., L. T., Ph. D. Ag. Principal, H. H. the Maharaja's Training College, Trivandrum.                      |
| 6 | Dean of the Faculty of Technology.                     | T. H. Matthewman Esq., M. Eng., M. I. E. E., Principal, College of Engineering, Trivandrum.                                    |

## FACULTIES

## Faculty of Arts.

- 1 Vacant.

## Ex-officio members.

(Section 3 (a) of Chapter V of the Statutes)

- 2 T. Damodaran Nambisan Esq., M. A., Professor, H. H. The Maharaja's University College, Trivandrum.
- 3 Rev. Fr. Englebert O. C. D., St. Joseph's English High School, Trivandrum.
- 4 V. Sundararaja Naidu Esq., M. A., B. L., Professor, H. H. The Maharaja's University College, Trivandrum.
- 5 E. T. Thomas Esq., M. A., L. T., B. A., (Cantab) Tripos, Professor, H. H. The Maharaja's University College, Trivandrum.

## Members nominated by the Syndicate.

THREE YEARS FROM 1ST AUGUST 1941

(Section 3 (b) of chapter V of the Statutes)

- 6 A. Gopala Menon Esq., M. A., B. Com., Director of Public Instruction, Trivandrum.
- 7 Rev. Fr. Romeo Thomas, T. O. C. D., M. A., L. T., Principal, St. Berchmans' College, Changanacherry.
- 8 T. M. Krishnamachari Esq., M. A., B. L., Retired Professor of History, College of Arts, Trivandrum.
- 9 A. Narayanan Tampi Esq., B. A., Bar-at-Law, Census Commissioner, Trivandrum.
- 10 T. I. Poonnen Esq., M. A., Union Christian College, Alwaye.
- 11 K. Jacob Esq., M. A., Lecturer, Union Christian College, Alwaye.
- 12 G. Gopalakrishna Aiyar Esq., M. A., Professor of English, H. H. The Maharaja's University College, Trivandrum.
- 13 T. Jacob Poonen, Esq., B. A., Retired Vice-Principal, C. M. S. College, Kottayam.

- 14 P. R. Krishna Aiyar Esq., M. A., Professor, St. Berchmans' College, Changanacherry.
  - 15 Miss Anna Nidiri, M. A., Acting Principal, College for Women, Trivandrum.
  - 16 A. P. O'Brien Esq., M. A., B. L., Professor, St. Berchmans' College, Changanacherry.
  - 17 Dr. A. Sivaramasubramonia Aiyar, M. A., Ph. D., Assistant Professor, H. H. The Maharaja's University College, Trivandrum.
- FROM 13TH JULY 1942.
- 18 A. M. Varki Esq., M. A., B. L., Lecturer, Union Christian College, Alwaye, (On leave.)

**Members nominated by the Vice-Chancellor.**

THREE YEARS FROM 1ST AUGUST 1941.

(Section 3 (b) of chapter V of the statutes)

- 19 M. R. Ry. Sadasyatilaka T. K. Velu Pillai, Avl., B. A., B. L., Advocate, Trivandrum.
  - 20 S. S. Suryanarayana Sastri, Esq., M. A., B. sc., Bar-at-law, Reader in Philosophy, University of Madras.
  - 21 The Rev. L. D. Murphy, S. J., M. A., Loyola College, Madras.
  - 22 K. Swaminathan, Esq., M. A., B. L., Presidency College, Madras.
  - 23 Dr. B. V. Narayanaswami Naidu, M. A., Ph. D., B. com. Bar-at-Law, Head of the Department of Economics, Annamalai University, Annamalai-nagar.
- FROM 6-3-1942.
- 24 M. R. Ry. Diwan Bahadur K. S. Ramaswami Sastri Avl., B. A., B. L., Retired District Judge, Madras.

**Faculty of Science.**

- 1 Dr. K. L. Moudgil, M. A., D. sc., F. I. C., Dean, Faculty of Science.

**Ex-officio members.**

(Section 3 (a) of Chapter V of the Statutes)

- 2 Dr. T. K. Koshy, M. A., Ph. D., F. R. M. S., F. L. a., Professor of Botany, H. H. The Maharaja's University College, Trivandrum.
- 3 K. R. Krishna Aiyar, Esq., M. A., Professor, H. H. The Maharaja's University College, Trivandrum.
- 4 Dr. C. C. John, M. A., D. sc., D. I. c., Head of the Department of Zoology, Trivandrum.
- 5 V. Sivaramakrishna Aiyar, Esq., M. A., Professor of Physics, H. H. The Maharaja's University College, Trivandrum.
- 6 Dr. H. Subramonia Aiyar, M. A., Ph D., Acting Principal H. H. The Maharaja's University College, Trivandrum.

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(Section 3 (b) of Chapter V of the Statutes)

THREE YEARS FROM 1ST AUGUST 1941.

- 7 Dr. C. R. Harler, B. sc., Ph. D., F. I. C., Chief Scientific Officer, Kanan Devan Hills Produce Co., Ltd., Munnar.
- 8 Dr. H. Parameswaran, M. A., Ph. D., D. sc., F. Inst. P., Secretary, Stores Purchase Committee, Trivandrum.
- 9 S. Ramakrishna Aiyar, Esq., M. A., Retired Professor of Physics, College of Science, Trivandrum.
- 10 P. Raman Pillai, Esq., B. A., B. sc., Bar-at-Law, Retired Conservator of Forests, Edappally.
- 11 M. R. Ry. Rao Bahadur T. V. Venkateswara Aiyar, Avl., M. A. Conservator of Forests, Trivandrum.



- 12 C. John, Esq., M. A. St. Berchmans' College, Changanacherry.
- 13 M. S. Raghavachari, Esq., M. A., St. Berchmans' College, Changanacherry.
- 14 K. R. Narayana Iyer, Esq., B. A., M. sc. Director of Argiculture, Travancore.
- 15 G. W. Trowell, Esq., M. sc. Vice-Principal, Scott Christian College, Nagercoil  
(on leave).
- 16 T. B. Ninan, Esq., M. A., Lecturer, Union Christian College, Alwaye.
- 17 T. S. Venkitaraman, Esq., M. A. Union Christian College, Alwaye.  
From 9-9-1942.
- 18 Mr. T. U. Philipose, B. A. M. sc., Lecturer, C. M. S. College, Kottayam.

**Members nominated by the Vice-chancellor.**

(Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

- 19 C. Lakshminarayanan, Esq. M. A., Professor of Zoology, Madras Christian College, Tambaram,
- 20 Dr. B. B. Dey, D. sc., F. I. C., I. E. S., Professor, Presidency College, Madras.
- 21 T. H. Matthewman, Esq., M. Eng., M. I. E. E., Principal, College of Engineering, Trivandrum.
- 22 K. P. P. Menon, Esq., B. A., B. sc. (Hons.) D. I. C., M. I. E. E., M. I. Mech. E., M. I. E., Electrical Engineer to Government.
- 23 Dr. K. S. Padmanabha Iyer, M. A., L. T., D. sc., Retired Professor of Zoology, College of Science, Trivandrum.

**FACULTY OF ORIENTAL STUDIES AND FINE ARTS.**

- 1 M. K. Ry. Rao Sahib Mahakavi Sahityabhushana Ullur S. Parameswara Iyer,  
Avl., M. A., B. L., Dean, Faculty of Oriental Studies and Fine Arts.

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(Section 3 (a) of Chapter V of the Statutes.)

- 2 Dr. K. Goda Varma, M. A., Ph. D. Superintendent of Studies in Malayalam H. H. the Maharaja's University College, Trivandrum.
- 3 C. Pannirukisaperumal Mudaliyar, Esq., M. A., B. L., Lecturer, H. H. The Maharaja's University College, Trivandrum.
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Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

- 5 Dr. Jayaram Cousins, D. Lit. Head of the Department of Fine Arts.
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- 12 Vaidyasastranipuna Dr. L. A., Ravi Varma, M. B. C. M., D. O. M. S., Honorary Director, Oriental Manuscripts Library, Trivandrum.
- 13 N. Gopala Pillai Esq., M. A. Ag. Principal, Sanskrit College.
- 14 Mrs. Lakshmikutty Narayanan Nair, M. A., Lecturer in Indian Music, College for Women, Trivandrum.

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- 18 D. Padmanabhan Unni, Esq., M. A., Lecturer, Union Christian College, Alwaye.

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(Section 3 (b) of Chapter V. of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

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- 20 C. V. Kunjuraman, Esq., Editor in chief The Kerala Kaumudhi and the Navajeevan, Mayyanad.
- 21 R. Vasudeva Poduval, Esq., B. A., Director of Archaeology, Travancore, Trivandrum.
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- 23 P. Anantan Pillai, Esq., M. A., Retired Superintendent of studies in Indian Languages, College of Arts, Trivandrum.
- 24 T. Lakshmanan Pillai, Esq., B. A., Retired Treasury Officer, Trivandrum.

From 24th January 1942

- 25 M. R. Ry. V. K. Raghunandana Menon, B. sc. (Hons), M. sc., Sarvadhikariakar Maharaja's Palace Tripunithura.

### **Faculty of Law.**

- 1 K. P. Padmanabha Pillai, Esq., B. A., LL. B. Bar-at-Law, Dean, Faculty of Law.

### **Members nominated by the Syndicate.**

(Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

- 2 Malloor K. Govinda Pillai, Esq., B. A., B. L., Retired Law College Principal, Trivandrum.
- 3 H. Ganapathy Aiyar, Esq., M. A., M. L., Professor, Law College, Trivandrum.
- 4 Dr. G. D. Nokes, LL. D., Barrister-at-Law, Judge, High Court, Trivandrum.
- 5 Kayalam Parameswaran Pillai, Esq. B. A., B. L., Retired Law Member to Government.
- 6 M. R. Ry. Rajyasevapravina G. Parameswaran Pillai, Avl. B. A., B. L., Chief Secretary to Government, Trivandrum.
- 7 T. K. Balakrishna Menon, Esq., B. A., B. L., Advocate, Trivandrum.
- 8 M. R. Ry. Rajyasevapravina U. Padmanabha Kukillaya, Avl. M. A., B. L. Advocate-General, Trivandrum.
- 9 K. G. Kunjukrishna Pillai, Esq., B. A., B. L., Advocate, Trivandrum.
- 10 E. Subramonia Iyer, Esq., M. A., M. L., Retired Principal, Law College, Trivandrum.
- 11 K. Narayanan, Esq., B. A., B. L., Professor, Law College, Trivandrum.
- 12 C. O. Madhavan, Esq., B. A., B. L., Mayor, City Corporation, Trivandrum.
- 13 Puthupally S. Krishna Pillai, Esq., B. A. B. L., Legal Remembrancer to Government, Trivandrum.
- 14 Joseph Thaliath, Esq., M. A., Bar-at-Law, Chief Justice, High Court, Travancore.
- 15 C. I. Parameswaran Pillai, Esq., B. A., B. L., Secretary, Bar Council, Trivandrum.

**Members nominated by the Vice-Chancellor.**

(Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

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- 17 S. Govindarajulu Nayudu, Esq., B. A., B. L., LL. B., Bar-at-Law, Vice-Principal Law College, Madras.
- 18 The Hon'ble Mr. Justice N. Chandrasekhara Aiyar, B. A., B. L., Madras.
- 19 K. Kuttikrishna Menon, Esq., B. A., B. L., Government Pleader, High Court, Madras.
- 20 P. I. Simon, Esq., B. A., B. L., Advocate, Trivandrum.
- 21 Kochikal P. Balakrishnan Tampi, Esq. B. A., B. L., Advocate, Trivandrum.

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- 1 Dr. D. Jivanayakom, M. A., L. T., Ph. D. Dean, Faculty of Education.

**Members nominated by the Syndicate.**

(Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

- 2 A. Narayanan Tampi, Esq., B. A., Bar-at-Law, Dip-in-Edn. Census Commissioner, Trivandrum.
- 3 A. Gopala Menon, Esq., M. A., B. Com. Director of Public Instruction.
- 4 V. Sundararaja Naidu, Esq., M. A., B. L., Professor, H. H. the Maharaja's University College, Trivandrum.
- 5 Miss O. Morton, Headmistress, Duthie English School, Nagercoil.
- 6 Miss K. N. Brockway, M. A., St. Christopher's Training College, Madras.
- 7 Miss Brookes-Smith, B. A. Headmistress, Balikamadam English High School, Thiruvella.
- 8 Kaimikkara M. Kunnara Pillai, Esq. M. A., L. T., Headmaster, N. S. S. English High School, Karuvatta.
- 9 K. P. Krishna Menon, Esq., B. A., L. T., General Manager and Inspector of N. S. S. Schools, Changanacherry.
- 10 Mathew Kuzhivelil, Esq., B. A., L. T., Assistant Superintendent, Department of Publications.
- 11 K. Sankaranarayana Aiyar, Esq., M. A., L. T., Lecturer, Training College, Trivandrum.
- 12 Sry. K. Sarada Amma, B. A., (Hons.) Dip-in-Edn, and Child Devpt. Acting Assistant Professor, H. H. the Maharaja's University College, Trivandrum.

**Members nominated by the Vice-Chancellor.**

(Section 3 (b) of Chapter V of the Statutes.)

THREE YEARS FROM 1ST AUGUST 1941.

- 13 S. Balakrishna Aiyar, Esq., B. A. L. T., (Teachers College, Saidapet, Madras, 1/1 Cathedral Road, Cathedral P. O., Madras.
- 14 Dr. M. Siddalingaiya, M. A., B. T., Ph. D., Dip. Edn. Professor, Maharaja's College, Mysore.
- 15 Miss M. E. East, M. A., (Cantab) Tripos, Teacher, B. M. H. S., Kottayam.
- 16 T. Y. Harris, Esq., M. A., L. T., Headmaster, English High School, Chengannur

**BOARD OF STUDIES.**

(THREE YEARS.)

**English**

1ST AUGUST 1941.

- 1 E. T. Thomas, Esq., M. A., L. T., B. A., (Cantab), Tripos, Head of the Department of English (Chairman-Ex-officio).
- 2 A. M. Varki Esq., M. A. B. L., Lecturer Union Christian College, Alwaye. (on leave)

3. G. Gopalakrishna Aiyar, Esq., M. A. Professor, H. H. the Maharaja's University College, Trivandrum.
4. V. K. Aiyappan Pillai, Esq., M. A., Professor, Presidency College, Madras.
5. Dr. A. Sivaramasubramonia Aiyar, M. A., Ph. D., Assistant Professor, H. H. The Maharaja's University College, Trivandrum.
6. A. P. O'Brien, Esq., M. A., B. L., Professor, St. Berchmans' College, Changanacherry.
7. Sry. B. Anandavalli Amma, B. A., (Hons.) Lecturer in English, College for Women, Trivandrum.

**Sanskrit.**

1st August 1941.

1. V. A. Ramaswami Sastri Esq., M. A. Head of the Department of Sanskrit, (Chairman Ex-officio).
2. N. Gopala Pillai Esq., M. A. Ag. Principal, Sanskrit College, Trivandrum.
3. V. Sankara Aiyar, Esq., M. A., L. T. Lecturer, H. H. the Maharaja's University College, Trivandrum.
4. M. R. Ry. Rao Sahib Mahakavi Sahityabhushana Ullur S. Parameswara Aiyar, Avl., M. A., B. L., Trivandrum.
5. Dr. C. Kunhan Raja, M. A., D. Phil., Reader in Sanskrit, University of Madras
6. P. P. S. Sastri, M. A., B. A., (Oxon.) Professor, Presidency College, Madras.
7. P. R. Doraswami Sarma, Esq., Siromani, B. O. L., St. Berchmans' College, Changanacherry.
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- 28 Dr. U. Sivaraman Nair, M. A., Ph. D., Assistant Professor, H. H. The Maharaja's University College, Trivandrum,  
 29 „ P. V. Nair, B. A., M. Sc., D. Phil., F. C. S., Industrial Chemist,

THE TRAVANCORE UNIVERSITY LABOUR CORPS.

RAISED IN SEPTEMBER 1939.

COLONEL-IN-CHIEF.

H. H. The Maharaja of Travancore.

COLONEL.

H. H. The Elaya Raja of Travancore.

COMMANDANT.

Captain T. H. Matthewman.

(OFFICERS,

- Lieutenant : T. K. Koshy.  
 „ A. Narayanan Tampi.  
 „ K. Narayanan.  
 „ K. P. Padmanabha Pillai.  
 „ D. L. Deshpande.  
 „ V. Narayana Pillai.  
 „ U. Sivaraman Nair.  
 „ F. I. Alexander  
 „ S. Sitarama Iyer.  
 2nd Lieutenant : K. Kyles.  
 „ A. V. Mathew.  
 „ K. C. Chacko.  
 „ A. S. Narayana Pillai  
 „ C. Balasubramoniam.  
 „ V. Sivasankaran Nair.  
 „ M. Martin Nathaniel.

Board of Finance and Accounts.

- 1 Vice-Chancellor—CHAIRMAN.  
 2 C. V. Chandrasekharan Esq., M. A., Pro-Vice-Chancellor, University of Travancore.  
 3 A. Lakshminarayana Aiyar, Esq., B. A., Financial Secretary to Government.  
 4 P. N. Padmanabha Pillai, Esq., B. A., B. L., Examiner of Local Fund Accounts.  
 5 S. Chattanatha Karayalar Esq., M. A., B. L., Deputy-President, Travancore Sri Mulam Assembly.  
 6 Kottur Kunjukrishna Pillai Esq., B. A., B. L., Second and Additional Sessions Judge, Nagercoil.  
 7 Registrar—Secretary.

Financial Adviser to the University.

P. N. Padmanabha Pillai, Esq., B. A., B. L., Examiner of Local Fund Accounts.

Representative of the University on the Inter-University Board, India.

C. V. Chandrasekharan, Esq. M. A.



## PREFATORY NOTE.

The University of Travancore was established under Act I of 1113 M. E. (1937-38) passed by His Highness the Maharaja of Travancore on the 1st November 1937.

Two Committees appointed by Government to investigate and report on the desirability and feasibility of a University for Travancore, had reported favourably, the first in 1919 and the second in 1924. But the question of educational reconstruction engaged the serious attention of Government only after the investiture of His Highness the present Maharaja with ruling powers in November 1931. The Government of His Highness found that the solution of the industrial and agricultural problems of the State demanded the establishment of a separate University, designed to meet the particular needs and adapted to the special circumstances of the country. With the assumption of office of the Dewan by Sachivottama Sir C. P. Ramaswami Aiyar, the idea of a Travancore University began to move from the plane of mere academic discussion to that of practical realization. In May 1937, Mr. C. V. Chandrasekharan, the Director of Public Instruction, was appointed Special University Officer to prepare a detailed scheme for the University; and on the basis of the memorandum submitted by him, the Travancore University Act was prepared, and it was issued on the auspicious occasion of His Highness' twenty-sixth birthday.

The chief aims of the Travancore University are :

- (i) to effect a reorganization of the system of education in the State with a view to the gradual development of technical and technological education ;
- (ii) to make greater and more systematic provision for the furtherance of original research in the various branches of Applied Science; and
- (iii) to provide for the conservation and promotion of Kerala Art and Culture.

The main authorities of the University are (i) the Senate (ii) the Syndicate and (iii) the Faculties. The Senate is the legislative body of the University and has general supervision over the affairs, concerns and properties of the University, subject to the ultimate control of Government. The Syndicate consisting of 12 members, forms the executive body of the University and the administration of the affairs of the University and the management of the institutions maintained by the University are vested in the Syndicate. The Faculties are advisory bodies to the Senate and the Syndicate in all matters of an academic character. At present there are six Faculties viz., those of Arts, Science, Technology, Oriental Studies and Fine Arts, Law and Education. Boards of Studies have also been set up for English, Sanskrit, Tamil, Malayalam, European Languages, Philosophy, History and Economics, Mathematics, Physics, Chemistry, Botany, Zoology, Law, Education, Textile Technology and Engineering.

At the time of the formation of the University there were six Government Colleges at Trivandrum. These were transferred to the control of the University and are now directly managed by the Syndicate. The question of the amalgamation of the Colleges of Science and of Arts was under the consideration of the University from the start. This amalgamation was sanctioned in 1941 and from June 1942, the Colleges have been merged into one institution, called His Highness the Maharaja's University College. The four private Colleges of the State have been admitted to the privileges of the University. All these Colleges were formerly affiliated to the Madras University.

Besides these Colleges, the University started and maintains an Institute of Textile Technology, where provision is made for Diploma Courses in (a) Textile Technology and (b) Textile Chemistry and Certificate Courses in (a) Weaving—Hand and Power Looms, (b) Bleaching, Dyeing, Printing and Finishing (c) Embroidery

Needlework and Knitting (for women only). The Central Technological Institute and the Minor Industrial Sections transferred to the University from the Department of Industries now form parts of this Institute.

The College of Engineering was started by the University and was opened in July 1939. The College provides instruction for Degree, Diploma and Certificate courses in Civil, Mechanical and Electrical Engineering.

Shortly after the formation of the University, a Department of Marine Biology and Fisheries was started for conducting investigations on problems relating to fisheries in the State. An Aquarium and a Marine Biology Laboratory were built. Later, Government sanctioned the separation of the Department of Fisheries from the Department of Agriculture and Fisheries and its transfer to the control of the Professor of Marine Biology and Fisheries in the University as a part of the Department of Research.

The Travancore Central Research Institute, established under the auspices of the University, devotes itself to research in the applied Sciences, particularly in subjects which have a special bearing on the agricultural and industrial condition of the State. The following research units, attached to the different departments of Government have been transferred to the control of the University :—

1. The Public Health Laboratory.
2. The Industrial Research Laboratory.
3. The Observatory.
4. The Water Analyst's Laboratory.

They form sections of the Institute.

A Council of Research has also been constituted with Heads of the Government Development Departments, University Professors, Heads of Sections in the Central Research Institute and nominees of Government and the University as Members to advise the Government and the University in matters relating to investigations in applied Sciences.

The management and control of the following institutions have also been transferred to the University :—

- i. The School of Arts.
- ii. The Trivandrum Public Library.

The University has established an Oriental Manuscripts Library and the Department for the Publication of Oriental Manuscripts transferred to the control of the University by the Government, has been amalgamated with the Library.

The Physical Education activities of the University have been brought under the control of the Board of Physical Education. The Travancore University Labour Corps, which takes the place of University Training Corps in other Universities has been started.

# Act 1 of 1113.

AN ACT TO ESTABLISH AND INCORPORATE A UNIVERSITY  
IN TRAVANCORE.

PASSED BY HIS HIGHNESS THE MAHARAJA OF TRAVANCORE  
UNDER DATE THE 16TH THULAM 1113 CORRESPONDING  
TO THE 1ST NOVEMBER 1937.

Preamble. Whereas We have decided to effect a reorganisation of the system  
of education in the State with a view to the gradual  
development of technical and technological edu-  
cation,

And whereas it is desirable to make greater and more systematic  
provision for furtherance of original research in the various branches of  
applied Science,

And whereas it is further desirable in the interests of the cultural  
and educational advancement of all classes of Our subjects, to provide  
for the conservation and promotion of Kerala Art and Culture,

And whereas We have deemed it necessary for the realisation of  
the aforesaid aims and purposes and for the further advancement of  
learning to establish and incorporate a University in Travancore,

We are hereby pleased to enact as follows.

1. (i) This Act may be called the Travancore University Act  
1113

Short title and  
commencement

(ii) This Section shall come into force at once. The rest of  
this Act shall come into force on such date or dates as Our Government  
may, by notification in the Gazette, appoint; and different dates may  
be appointed for different provisions of this Act.

2. In this Act, unless there is something repugnant in the subject or  
Definitions. context :—

(a) "College" means a College maintained by, or admitted to  
the privileges of the University;

(b) "Dean" means the President of a Faculty of the University;

(c) "Faculty" means a Faculty of the University;

(d) "Senate" means the Senate of the University;

(e) "Syndicate" means the Syndicate of the University;

(f) "The University" means the University of Travancore;

(g) "Registered Graduates" means graduates registered under the  
provisions of this Act and the Statutes;

(h) "Statutes," "Ordinances" and "Bye-laws" mean the  
Statutes, Ordinances and Bye-laws respectively of the University, for  
the time being in force;



(i) "Teacher" means a Professor, Assistant Professor, Reader, Lecturer, Instructor, or such other person imparting instruction, or supervising or controlling research in any of the Colleges or other educational institutions of the University ;

(j) "Student" means a part-time or full-time student receiving instruction or carrying on research in any of the Colleges or other educational institutions of the University ;

(k) "Private College" means a College not maintained by the University but admitted to the privileges of the University.

#### THE UNIVERSITY.

3. (i) The Vice-Chancellor, the Pro-Vice-Chancellor, if any, and the members of the Senate and of the Syndicate, so long as they continue to hold such office or membership as the case may be, shall constitute a body corporate with the name of the University of Travancore

The University,

(ii) The University shall have perpetual succession and a common seal, and may sue and be sued by the aforesaid name.

(iii) Subject to the provisions of this Act, the University shall be able and capable in law to take, purchase and hold any property movable or immovable, which may become vested in it for purpose of the University by purchase, grant, testamentary disposition or otherwise ; and shall be able and capable in law to grant, demise, alien or otherwise dispose of all or any of the property belonging to the University and also to do all other acts incidental or appertaining to a body corporate.

(iv) All immovable property transferred to the University by Our Government shall be under the direction, management and control of the University and applied by it as trustee subject to the provisions and for the purposes of this Act.

4. The University shall have the following powers, namely :

Powers of the University.

(i) to provide for instruction in such branches of learning as the University may deem fit, and to make provision for research, and for the advancement and dissemination of knowledge ;

(ii) to institute degrees, titles, diplomas and other academic distinctions ;

(iii) to confer degrees and other academic distinctions on persons who shall have pursued a prescribed course of study and shall have passed the prescribed examination, or who shall have carried on research under prescribed conditions ;

(iv) to confer honorary degrees or other distinctions on approved persons in accordance with the conditions to be prescribed in the Statutes ;

(v) to grant diplomas, certificates or other distinctions to persons who shall have pursued a prescribed course of study under prescribed conditions ;

(vi) to withdraw or cancel degrees, titles, diplomas, certificates or other distinctions under conditions that may be prescribed by the Statutes ;

(vii) to inspect Colleges and Hostels ;

(viii) to exercise such control over the students as will secure their physical and moral well-being ;

(ix) to hold and manage endowments, and to institute and award fellowships, scholarships, studentships, exhibitions, bursaries, medals and prizes ;

(x) to co operate with other Universities or any authorities or associations in such manner as the University may determine for the purpose of carrying out the objects of the University ;

(xi) to do all such other acts as may be required to further the aims and purposes of this Act.

5. No person shall be excluded from membership of any of the authorities of the University or from admission to any degree or course of study on the sole ground of sex, race, creed, class or political views and it shall not be lawful for the University to adopt or impose on any person any test whatsoever relating to religious belief or profession or political views, in order to entitle him to be admitted thereto as a teacher, or a student, or to hold any office therein or to graduate thereat, or to enjoy or exercise any privileges thereof, except where in respect of any particular benefaction accepted by the University such test is made a condition thereof.

#### The Chancellor

6. The Chancellor shall be the Supreme Head of the University and may, at any time, issue any order he thinks fit in the interests and in the furtherance of the aims and objects of the University.

7. We shall be pleased to be the Chancellor of the University.

#### The Pro-Chancellor

8. The Chancellor may, at any time, nominate a Pro-Chancellor to exercise such powers and functions of the Chancellor as may be delegated to him by the Chancellor. The Pro-Chancellor shall, in all public functions connected with the University, take rank and precedence immediately after the Chancellor.

### Officers of the University

9. The following shall be Officers of the University :—

- (1) The Vice-Chancellor,
- (2) The Pro-Vice-Chancellor, if any
- (3) The Registrar, and
- (4) Such other officers as may be provided for by the Statutes.

10. (i) The Vice-Chancellor shall be appointed by the Chancellor under Sign Manual and shall hold office during the pleasure of the Chancellor, and shall receive such remuneration, if any, as may be fixed in this behalf.

(ii) The Vice-Chancellor shall take rank next to the Chancellor and to the Pro-Chancellor, if any. He shall be the principal executive officer of the University and shall, in the absence of the Chancellor and Pro-Chancellor, preside at meetings of the Senate and at any Convocation of the University. He shall be a member, *ex-officio* and Chairman of the Senate and the Syndicate and shall be entitled to be present at and to address any meeting of any authority of the University but shall not be entitled to vote thereat unless he is a member of the authority concerned.

(iii) It shall be the duty of the Vice-Chancellor to ensure that the provisions of this Act, the Statutes and the Ordinances are faithfully observed and carried out and he may exercise all powers necessary for this purpose.

(iv) The Vice-Chancellor shall have the right of visiting and inspecting Colleges and other institutions maintained by or admitted to the privileges of the University.

(v) The Vice-Chancellor may take action in any emergency which in his opinion, calls for immediate action. In such a case he shall, as soon as may be thereafter, report his action to the officer or authority who or which would ordinarily have dealt with the matter.

(vi) The Vice-Chancellor shall exercise such other powers and perform such other functions as may be prescribed by the Statutes.

11. In the event of the Vice-Chancellor being at any time an honorary or part-time officer the Chancellor may appoint a Pro-Vice-Chancellor to whom the Vice-Chancellor may, with the previous sanction of the Chancellor, delegate in writing all or any of his powers and duties as he deems fit. The Pro-Vice-Chancellor shall hold office during the pleasure of the Chancellor and shall receive such remuneration as may be fixed by Our Government.

12. The Registrar shall be a whole-time officer appointed by Our Government in consultation with the Syndicate. He shall exercise such powers and perform such duties as may be prescribed by the Statutes, or required from time to time by the Syndicate or by the Vice-Chancellor.

Registrar.

#### Authorities of the University

13. The following shall be the authorities of the University ;

- Authorities-
- (a) The Senate
  - (b) The Syndicate,
  - (c) The Faculties, and
  - (d) Such other authorities as may be provided for in the Statutes

#### The Senate.

14. (a) The Senate shall consist of the following members namely :

The Senate.

#### *Class I -- Ex-officio Members.*

- (i) The Vice-Chancellor.
- (ii) The Pro-Vice-Chancellor, if any.
- (iii) The Director of Public Instruction, Travancore.
- (iv) The Deans of the Faculties.
- (v) Principals of Colleges.
- (vi) Members of the Syndicate who are not otherwise members of the Senate.
- (vii) Such other ex-officio members as may be prescribed by the Statutes.

#### *Class II -- Elected Members.*

- (viii) Seven members elected by the Registered Graduates from among themselves.
- (ix) Three members elected from among themselves by the non-official members of the Sri Mulam Assembly.
- (x) Two members elected from among themselves by the non-official members of the Sri Chitra State Council.
- (xi) One member, other than the Principal, elected by and from the teaching staff of each private College in which instruction is given to a degree standard.
- (xii) One member other than the Dean elected by each of the Faculties.

### *Class III—Life Members.*

- (xiii) Such persons as may be appointed by the Chancellor to be life members on the ground that they have rendered eminent services to education.
- (xiv) All persons who have contributed not less than ten thousand rupees or transferred property of the like value to the University Fund for the general purposes of the University.

### *Class IV—Other Members.*

- (xv) Not more than twenty members nominated by the Chancellor.
- (xvi) One representative of each of such associations as undertake to make to the University an annual contribution of rupees one thousand or more, for a period of not less than five years, so long as the contributions continue to be paid.
- (b) The Senate shall be reconstituted every three years. Every member of the Senate other than ex-officio and life members shall, subject to the provisions of this Act and the Statutes, hold office until the next reconstitution of the Senate :

Provided, however, that wherever a person is nominated or elected in his capacity as a member of a particular body or as the holder of a particular office he shall cease to be a member of the Senate when he ceases to be a member of that body or the holder of that office, as the case may be.

15. (a) Subject to the provisions of this Act and the Statutes the Senate shall have general superintendence over the Powers of the Senate. affairs, concerns and property of the University and shall exercise all the powers of the University not otherwise provided for.

(b) The Senate shall, subject to the provisions of this Act and the Statutes have the following powers :—

(i) to determine what degrees, diplomas and other academic distinctions shall be granted by the University ;

(ii) to prescribe the course of study and the duration thereof ;

(iii) to make, amend, or repeal Statutes either of its own motion or on the motion of the Syndicate, and to consider and cancel Ordinances under conditions laid down by the Statutes ;

(iv) to review the Annual Report and the Annual Accounts of the University which shall be placed before it by the Syndicate, and to consider and pass the Budget according to the provisions of the Statutes ;

(v) to accept endowments, bequests, donations and transfers of any movable or immovable property on behalf of the University;

(vi) to institute fellowships, scholarships, studentships, bursaries, exhibitions, medals and prizes in accordance with the provisions of this Act and the Statutes and the Ordinances;

(vii) to institute Professorships, Readerships, Lecturerships, and such other teaching or research posts as it may deem necessary;

(viii) to establish and maintain such institutions as it may, from time to time, deem necessary;

(ix) to appoint a Standing Committee and to delegate to it such powers of the Senate as it may deem fit;

(x) to perform such other functions as are assigned to it by this Act or the Statutes.

#### The Syndicate

16. The Syndicate shall consist of the following members,  
The Syndicate.      namely:

#### *Class I--Ex-officio Members.*

- (i) The Vice-Chancellor.
- (ii) The Pro Vice-Chancellor, if any.
- (iii) The Director of Public Instruction, Travancore.

#### *Class II - Other Members.*

- (iv) Two representatives of the private Colleges
- (v) Two members elected from and by the Senate of whom one at least, shall be a person not engaged in or connected with the profession of teaching.
- (vi) Five members nominated by the Chancellor of whom at least three shall be Deans of Faculties.

17. Members of the Syndicate, other than ex-officio members, shall hold office for a period of three years from the date

Term of office.

of their election, nomination or appointment, provided that a person elected, nominated or appointed in his capacity as a member of a particular body or as the holder of a particular office shall be a member of the Syndicate only so long as he continues to be a member of that body or the holder of that office, as the case may be.

18. Subject to the provisions of this Act and the Statutes, the executive government of the University, including the general superintendence and control over the institutions of the University, shall be vested in the

Powers.

Syndicate; and subject likewise, the Syndicate shall have the following powers:

- (a) to make Ordinances and amend or repeal the same;
- (b) to propose Statutes for the consideration of the Senate;

(c) to hold, control and administer the properties and funds of the University ;

(d) to direct the form, custody and use of the common seal of the University ;

(e) to arrange for and direct the inspection of Colleges, Hostels and other institutions ;

(f) to prescribe the qualifications of teachers (i) in the Colleges, and (i) in the institutions maintained by the University ;

(g) to charge and collect such fees as may be prescribed by Ordinances ;

(h) to award fellowships, scholarships, studentships, bursaries, exhibitions, medals and prizes in accordance with the provisions of this Act and the Statutes and the Ordinances ;

(i) to exercise supervision and control over the residence and discipline of students ;

(j) to frame the Financial Estimates of the University and to submit them to the Senate in accordance with the provisions of the Statutes made in this behalf ;

(k) to conduct the University Examinations and approve and publish the results thereof ;

(l) to decide what examinations of other Universities may be accepted as equivalent to those of this University ; and to negotiate with other Universities for the recognition of the examination of this University ;

(m) to appoint members to the Boards of Studies ;

(n) to appoint Boards of Examiners ;

(o) to exercise such other powers and perform such other duties as may be prescribed by this Act, the Statutes and the Ordinances ;

(p) to delegate any of its powers to the Vice-Chancellor or to the Pro-Vice-Chancellor or to a Committee appointed from among its own members.

#### **The Faculties.**

19. (a) The University shall have the following Faculties :—

Faculties.

(i) The Faculty of Arts.

(ii) The Faculty of Science.

(iii) The Faculty of Technology.

(iv) The Faculty of Oriental Studies and Fine Arts.

(v) The Faculty of Law.

(vi) The Faculty of Education.

(vii) Such other Faculties as may be constituted, from time to time, by the Statutes.

(b) The Faculties shall act in an advisory capacity of the Senate and the Syndicate in all academic matters, and shall perform such other functions as may be prescribed by the Statutes and Ordinances.

#### Institutions.

20. (a) H. H. The Maharaja's College of Art's, H. H. The Maharaja's College of Science, H. H. The Maharaja's College for Women, H. H. The Maharaja's Training College, H. H. The Maharaja's Sanskrit College and H. H. The Maharaja's Law College are hereby transferred to the University and placed under its maintenance and control.

(b) Our Government may, from time to time, transfer to the University any other institution subject to such terms and conditions as they may deem fit to impose as regards its future maintenance and control; and the University may accept such transfer and it shall abide by such terms and conditions:

Provided that any such term or condition may be rescinded or varied by Our Government at any time.

(c) The Colleges specified below in this sub-section are admitted to the privileges of the University and they shall retain such privileges subject to the provisions of the Statutes and Ordinances:—

Private College

- (1) The Union Christian College, Alwaye.
- (2) The St. Berchmans' College, Changanacherry.
- (3) The C. M. S. College, Kottayam.
- (4) The Scott Christian College, Nagercoil.

#### Finance and control.

21. (a) All properties, movable and immovable, belonging to the Colleges transferred to the University under Section 20 (a) and to such other institutions as may hereafter be transferred by Our Government to the University shall vest in the University, subject to such conditions, if any, as Our Government may lay down from time to time.

(b) Subject to the provisions of this Act and the conditions that may be laid down by Our Government in this behalf, all grants made by Our Government from time to time, and all sums paid or endowments made by private persons or local authorities for the purposes of the University, together with all fees received and rents and profits and other income derived from the property and funds vested in the University, shall form a fund styled the University Fund, which shall be at the disposal of the University to be employed for the purposes mentioned in this Act and in the Statutes and Ordinances.



(c) The University Fund shall be managed and administered according to the provisions of this Act and the Statutes.

(d) The maintenance of Colleges and other institutions by the University shall be in accordance with the provisions of the Statutes framed in this behalf.

22. (a) Our Government shall have power, at any time, to order an audit of the accounts of the University by such auditors as they may direct.

Powers of Government.

(b) Our Government may, at any time, cause an inspection to be made, by such person or persons as they may direct, of the University, its buildings, laboratories, libraries, museums, workshops and other appurtenances, and of the institutions controlled by or admitted to the privileges of the University, and also of the teaching and other work conducted or done by or on behalf of the University, and to cause an inquiry to be made in respect of any matter connected with the University. Our Government shall, in every case, give notice to the University of their intention to cause such inspection or inquiry to be made, and the University shall be entitled to be represented thereat. A copy of the finding of such inspection or inquiry shall be forwarded to the Syndicate by Our Government with such instructions as appear to Our Government to be necessary and desirable. The Syndicate shall report to Our Government, within such time as may be fixed by Our Government, such action as has been taken or is proposed to be taken in pursuance of the instructions of Our Government.

(c) If, at any time, Our Government are of opinion that the affairs of the University are not managed in accordance with this Act or the Statutes or the Ordinances, or in the furtherance of the objects and purposes of this Act, they may call for an explanation from the Syndicate in regard to any matter connected with the University. If the Syndicate fail to offer any explanation within the time prescribed, or if the explanation offered is in the opinion of Our Government, unsatisfactory, Our Government may issue such instructions as they may deem fit; and the Syndicate shall comply with such instructions. Our Government may also exercise all the powers necessary to enforce compliance with their instructions.

#### The Statutes, Ordinances and Bye-laws.

23. Subject to the provisions of this Act, the Statutes may provide for all or any of the following matters :—

Statutes.

(a) The powers and duties of the Officers of the University in so far as these are not provided for herein.

(b) The constitution, powers and duties of the Authorities of the University in so far as these are not provided for herein.

(c) The election of members to the Syndicate, the Senate and other Authorities of the University and all such other matters relating to these bodies, as may be necessary or desirable to provide.

(d) The degrees, diploma, titles, certificates and other academic distinctions to be awarded by the University.

(e) The withdrawal or cancellation of degrees, diplomas, titles, certificates and other academic distinctions.

(f) The maintenance of a Register of Graduates.

(g) The holding of Convocations to confer degrees.

(h) The conferment of Honorary Degrees.

(i) The maintenance of the accounts and the preparations and passing of the Annual Budget of the University.

(j) All such other matters as are required or authorised by this Act to be prescribed by means of Statutes.

24. (a) The Senate may take into consideration the draft of any Statute either of its own motion or as proposed by the Syndicate.

Procedure of making Statutes.

(b) Where, either of its own motion or as proposed by the Syndicate a draft Statute has been placed before the Senate for its consideration, the Senate may pass the Statute with or without amendments, or reject it, or refer it to the Syndicate for resubmission together with any amendments that the Senate may suggest; provided that before any Statute is passed affecting the powers or duties of any Officer or the constitution, powers or duties of any Authority of the University, the opinion of the Syndicate and a report from the Officer, or Authority concerned shall have been taken into consideration by the Senate.

(c) All Statutes passed by the Senate shall be submitted to Our Government and Our Government may sanction, disallow or remit the same for further consideration.

(d) No statute and no amendment or repeal of an existing Statute made by the Senate shall have effect until it is assented to by Our Government.

#### The Ordinances.

25. Subject to the provisions of this Act and the Statutes, the Ordinances may provide for all or any of the following matters:—

Ordinances.

(a) The courses of study and the conduct of examinations.

(b) The admission of students to the various courses of study and to the examination.

- (c) The levy of fees in Colleges and other institutions maintained by the University.
- (d) The residence and discipline of students.
- (e) Qualifications of Teachers.
- (f) The appointment and prescription of the duties of Boards of Studies and Boards of Examiners.
- (g) The number and designations of Officers of the University, their powers and duties and the terms for which they shall hold offices in so far as these matters are not provided for in the act and the Statutes.
- (h) All such other matters as may, in accordance with the provisions of this Act and the Statutes, be prescribed by Ordinances.

26. The procedure to be followed in making, amending and repealing Ordinances shall be prescribed by the Statutes.

Procedure for making Ordinances.

27. The Syndicate shall have power to frame Bye-laws not inconsistent with the provisions of this Act, the Statutes and the Ordinances for the guidance and working of Boards and Committees and other bodies constituted under the provisions of this Act or the Statutes or Ordinances and for regulating the procedure and conduct of business at meetings of University Authorities other than the Senate.

Bye-laws.

#### Miscellaneous.

28. (a) No act or proceeding of the Senate, the Syndicate, or other body constituted under this Act or the Statutes or the Ordinances shall be deemed to be invalid merely by reason of any vacancy in the body doing or passing it at the time any such act or proceeding is done or passed.

Miscellaneous.

(b) Notwithstanding anything contained in this Act, all Professors, Assistant Professors, Lecturers and other Officers and servants now employed in the Colleges specified in Section 20 (a) and all such as may be employed hereafter for carrying on the work of the University, shall, unless a reservation to the contrary is made at the time of their appointment, be deemed to be employees holding appointments under Our Government, and shall in all respects, be governed by the Rules framed by Our Government and in force for the time being in respect of such employees.

(c) The appointment of the Pro-Chancellor, the Vice-Chancellor, the Pro-Vice-Chancellor and the Registrar shall be notified in Our Government Gazette,

### Transitory Provisions.

29. Notwithstanding anything contained in this Act, Our Government shall exercise such powers as may be required to give effect to the provisions of this Act, the Statutes and the Ordinances till such time as the authorities competent to exercise such powers under the provisions of this Act or the Statutes or the Ordinances, are appointed or constituted.

30. (a) Notwithstanding anything contained in this Act, the first members of the Senate and of the Syndicate shall be nominated by the Chancellor and they shall hold office for a period of two years from the date of their appointment, unless they vacate sooner by resignation or other cause. Any casual vacancies among such members shall be filled up by Our Government; and a member appointed to fill such vacancy shall be a member for the remaining portion of the said term of two years.

(b) The first Register shall be appointed by Our Government.

31. (a) It shall be the duty of the Vice-Chancellor to make all arrangements necessary for constituting the Senate and the Syndicate in accordance with the provisions of this Act within such period as shall enable those authorities to function on the expiry of the period of membership of the first members appointed under Section 30 (a).

(b) The Vice-Chancellor shall have power to frame and submit to Our Government for approval the first Statutes and Ordinances and Bye-Laws that may be necessary for the proper functioning of the University and the Statutes and Ordinances so framed and approved shall be published in Our Government Gazette and shall be in force until they are amended, repealed or replaced by the authorities competent to do so under the provisions of this Act.

(c) The Vice-Chancellor may appoint such clerical and menial staff as may be necessary to carry on the work of the University and may make such other arrangements as may be necessary to enable this Act or any part thereof to be brought into operation.

32. Notwithstanding anything contained in this Act, the Colleges specified in section 20 may continue their connection with the University of Madras for such minimum period as may be required to enable students who are now pursuing a course of study leading to any examination of the University of Madras to complete that course and to sit for the examination; and the University and the Colleges shall provide for such students instruction in accordance with the curricula of studies prescribed by the University of Madras.

## FIRST STATUTES.

(Passed under Section 31 (b) of Act I of 1113).<sup>1</sup>

## Preliminary.

In these Statutes, unless there is something repugnant in the subject or context : —

- (a) "College" means a College maintained by, or admitted to the privileges of the University ;
- (b) "Dean" means the President of a Faculty of the University ;
- (c) "Faculty" means faculty of the University ;
- (d) "Senate" means the Senate of the University ;
- (e) "Syndicate" means the Syndicate of the University ;
- (f) "The University" means the University of Travancore ;
- (g) "Registered Graduates" means graduates registered under the provisions of the Travancore University Act and the Statutes ;
- (h) "The Act" means the Travancore University Act ;
- (i) "Statutes," "Ordinances" and "Bye-laws" mean the Statutes, Ordinances and Bye-laws respectively of the University, for the time being in force ;
- (j) "Teacher" means a Professor, Assistant Professor, Reader, Lecturer, Instructor, or such other person imparting instruction, or supervising or controlling research in any of the Colleges or other educational institutions of the University ;
- (k) "Student" means a part-time or full-time student receiving instruction or carrying on research in any of the Colleges or other educational institutions of the University ;
- (l) "Private College" means a College not maintained by the University, but admitted to the privileges of the University ;
- (m) "Hostel" means a place of residence for students, maintained or recognised by the University.

## CHAPTER I.

## VICE-CHANCELLOR.

1. The Vice-Chancellor shall have power to convene meetings of the Senate and the Syndicate, and when necessary, of any other University body.

2. The Vice-Chancellor shall nominate one of the teachers in each department of study to be the Head of that department.

3. The Vice-Chancellor shall be in complete control of the University Office and shall have the power to fix the clerical and menial establishment necessary for carrying on the work of the University and to appoint, dismiss or suspend or otherwise punish any member of the clerical and menial establishment.

4. The Vice-Chancellor shall have power to make appointments to all teaching and other academic posts the pay or maximum pay of which does not exceed Rs. 150 per mensem, and to dismiss, suspend or otherwise punish persons whom he is competent to appoint.

5. The Vice-Chancellor shall exercise general supervision over the educational arrangements of the University, regulate the admission of students, and maintain the discipline of the University.

6. The Vice-Chancellor may at any time nominate any person to inspect and report on the teaching, equipment and general condition of any college, hostel or other institution connected with the University.

7. The Vice-Chancellor may, in matters which are not provided for in the Act, the Statutes or the Ordinances, and in which he considers a reference to Government necessary, make a reference thereon to Government.

8. The Vice-Chancellor shall have power to sanction grants-in-aid to private colleges and hostels from the funds placed at the disposal of the University by the Government for the purpose.

9. In the absence of the Vice-Chancellor the Pro-Vice-Chancellor shall exercise the powers and perform the duties of the Vice-Chancellor. When the offices of the Vice-Chancellor and Pro-Vice-Chancellor are both vacant, the Syndicate shall, with the approval of the Chancellor make the requisite arrangements for exercising the powers and performing the duties of the Vice-Chancellor.

10. In any matter connected with the management, administration and development of the University, the Vice-Chancellor may take the necessary initiative.

## CHAPTER II. THE REGISTRAR.

1. The Registrar shall be the custodian of the records and of the common seal of the University committed to his charge by the Syndicate.

2. He shall act as Secretary to the Senate, the Syndicate, the Faculties and the Committees appointed by these bodies, but he shall not be a member of the Syndicate.

3. It shall be the duty of the Registrar—

- (i) to conduct the official correspondence of the University ;
- (ii) to issue notice convening meetings of the Senate, the Syndicate, the Faculties, Boards of Studies and Boards of Examiners and any Committees appointed by these bodies ;
- (iii) to prepare and maintain a record of the proceedings of meetings of the Senate, the Syndicate, the Faculties and of any Committees appointed by the authorities ;
- (iv) to maintain a Register of Graduates, a Register of Donors and a Register of Endowments ;
- (v) to manage the property and investments of the University and the University fund under the directions of the Syndicate ;
- (vi) to sign contracts and other agreements on behalf of the University ;
- (vii) to perform such other work, as may, from time to time be prescribed by the Syndicate, and generally to carry out the orders of, and render such assistance as may be desired by the Vice-Chancellor in the performance of his official duties.

4. Members of the Senate, the Syndicate and the Faculties shall have access to the proceedings of the respective bodies and to documents connected with such proceedings and the Registrar shall on application made to him by any such member, fix a suitable date and hour for the purpose.

5. The Registrar shall under the direction of the Vice-Chancellor make all the necessary arrangements for the conduct of election to the authorities of the University and for the conduct of the University Examinations.

## CHAPTER III.

### SENATE

#### Constitution

1. In addition to the officers mentioned in sub-section (a) of section 14 of the Act, the following persons shall be ex-officio members of the Senate ;

- (i) The Chief Justice of the High Court of Travancore.
- (ii) The Chief Secretary to Government.
- (iii) The Financial Secretary to Government.
- (iv) The Advocate-General.
- (v) The Chief Engineer.
- (vi) The Registrar of the University.

2. The ordinary members of the Senate nominated by the Chancellor under section 14 (a) of the Act shall include two of the Headmasters of English High Schools in the State and five educationists from outside Travancore.

3. The seven members of the Senate to be elected by the Registered Graduates of the University under section 14 (a) of the Act shall be elected by them on the principle of Proportional Representation by means of the single transferable vote in accordance with the Statutes framed in this behalf.

#### Powers.

4. In addition to the powers conferred on the Senate by the provisions of the Act, the Senate shall have power :--

(i) to confer degrees, and other academic distinctions on persons (1) who unless exempted therefrom in the manner prescribed shall have pursued a prescribed course of study in the University and shall have passed the prescribed examination, or (2) who shall have carried on research under prescribed conditions;

(ii) to grant diplomas, titles, certificates and other distinctions to persons who shall have pursued a prescribed course of study under prescribed conditions;

(iii) to confer honorary degrees or other distinctions on approved persons in accordance with the conditions prescribed by Statutes;

(iv) to provide for research and the advancement of knowledge in such branches of learning as it may deem necessary;

(v) to establish, equip and maintain institutions for scientific research;

(vi) to establish Hostels, Students' Unions, University Athletic Clubs, a University Training Corps, a Students' Information Bureau, and other similar institutions for promoting the welfare of the students;

(vii) to establish, equip and maintain a University Library;

(viii) to institute a Publication Department which will be managed in accordance with Ordinances framed by the Syndicate for the purpose;

(ix) to establish, equip and maintain a University Press.

5. When an elected or nominated member of the Senate is appointed temporarily to any office by virtue of which he is entitled to be a member of the Senate ex-officio, he shall, within fifteen days of his taking charge of his appointment, inform the Registrar whether he will continue to be a member of the Senate by virtue of his election or nomination or whether he will vacate his seat as such member and become a member ex-officio by virtue of his appointment. On failure to inform the Registrar of such choice, he shall be deemed to have vacated his seat as an elected or nominated member.



When a person ceases to be a member of the Senate he shall cease to be a member of any of the authorities of the University of which he may happen to be a member by virtue of his membership of the Senate.

6. The Senate may, on the recommendation of not less than two-thirds of the members of the Syndicate, remove the name of any person from the Register of Graduates, or remove any person from membership of any authority of the University if he has been convicted by a Court of Law of what in the opinion of the Senate is a serious offence involving moral turpitude. The Senate may also remove any person from membership of any authority of the University if he becomes of unsound mind or deaf-mute or suffers from any chronic and virulent contagious disease or has applied to be adjudicated or has been adjudicated a bankrupt or insolvent.

#### Meetings.

7. There shall be two ordinary meetings of the Senate in the year on dates to be fixed by the Vice-Chancellor; one of them shall be the annual meeting at which the Annual Report, the Annual accounts and audit report, and the Financial Estimates shall be presented.

The Senate may also meet at such other times as it may determine.

8. The Vice-Chancellor may, whenever he thinks fit, and shall, upon a written requisition signed by not less than 25 members of the Senate, convene a special meeting of the Senate. Any requisition for a special meeting must be accompanied by a copy of the resolution or resolutions to be moved at the meeting together with the name of the proposer of each such resolution.

#### Notice of Meetings.

9. (a) The Registrar shall, under the direction of the Vice-Chancellor, give not less than four weeks' notice of the date of an ordinary meeting; provided, however, that it shall be competent to the Vice-Chancellor to postpone a meeting of the senate of which due notice has already been given, without fresh notice under this section. The Registrar shall also send with the notice of the Annual Meeting, to each member, copies of the Annual Report and the Annual Accounts and Audit Report and the Financial Estimates.

(b) Fifteen clear days' notice shall ordinarily be given of a special meeting convened by the Vice-Chancellor at his discretion under Statute 8; but in case of emergency the Vice-Chancellor may convene a special meeting at shorter-notice. Along with the notice of the meeting the Registrar shall also send to each member a statement of the business to be transacted at the meeting.

(c) When a special meeting is convened by the Vice-Chancellor on a requisition under Statute 8, fifteen clear days' notice shall be given

to members. Along with the notice the Registrar shall send to each member a copy of the resolution or resolutions, with the name of the mover of each resolution, to be moved at the meeting.

10. (a) Any member who wishes to move a resolution at an ordinary meeting of the Senate shall forward to the Registrar a copy of the resolution so as to reach him not less than twenty-one clear days before the date of the meeting. In the case of resolutions relating to amendments of an existing Law of the University, the form in which the Law as amended would stand shall also be stated.

(b) A member who has forwarded a resolution may, by giving written notice, which shall reach the Registrar not less than five days before the date fixed for the meeting, withdraw the resolution.

(c) It shall be competent to the Vice-Chancellor to disallow any resolution, which in his opinion, does not fall within the purview of the Senate or otherwise contravenes the provisions of the Act.

(d) The Registrar shall include in the agenda paper all resolutions of which due notice has been given and which have not been withdrawn or disallowed.

11. (a) Not less than fifteen clear days before the date fixed for an ordinary meeting, the Registrar shall issue to every member an agenda paper specifying the day and the hour of the meeting and the business to be brought before the meeting; but the non-receipt of the agenda paper by any member shall not invalidate the proceedings of the meeting.

Provided that the Syndicate or the Vice-Chancellor may bring forward before any meeting of the Senate any business considered urgent by them without placing it on the agenda paper,

(b) A member who wishes to move an amendment to any item included in the agenda paper shall forward a copy of the proposed amendment so as to reach the Registrar not less than nine clear days before the day of the meeting.

(c) Notwithstanding the notice for resolutions prescribed in Statute 10, any member who wishes to move a resolution on any report or statement by the Syndicate included in the agenda paper, or on any Ordinance placed before the Senate and included in the agenda paper may do so by giving notice of the resolution which shall reach the Registrar not less than nine clear days before the day of the meeting.

Provided that no such notice shall be necessary in the case of resolutions relating to urgent business brought forward by the Syndicate or the Vice-Chancellor and not included in the agenda.

(d) The Registrar shall issue to every member of the Senate not less than four clear days before the date of the meeting, a copy of

the final agenda paper showing all the resolutions and amendments of which due notice has been given.

12. (a) At a special meeting of the Senate convened by the Vice-Chancellor on a requisition by members under Statute 8, only the resolutions given notice of by the requisitionists, and amendments thereto and such urgent business as may be brought forward by the Syndicate or the Vice-Chancellor shall be transacted.

(b) At a special meeting of the Senate convened by the Vice-Chancellor at his discretion no business other than that brought forward by the Syndicate or the Vice-Chancellor shall be transacted.

13 (a) In the case of a special meeting of the Senate the Registrar shall issue with the notice of the meeting an agenda paper showing the business to be brought before the meeting.

(b) A member who wishes to move an amendment to any item on the agenda shall forward a copy of the proposed amendments so as to reach the Registrar not less than ten clear days before the date of the meeting provided that in the case of a special meeting of which less than fifteen days' notice has been given the Vice-Chancellor may accept amendments on short notice.

(c) The Registrar shall issue to every member, not less than five clear days before the day of the meeting, a copy of the revised agenda paper containing the resolutions and amendment of which notice has been given. However, when the Vice-Chancellor considers it necessary he may allow the revised agenda paper to be issued at a shorter interval before the meeting or to be placed before the members at the meeting.

(d) The Vice-Chancellor or the Syndicate may bring before a special meeting any business considered urgent by them without placing the same on the agenda paper.

14. Unless the Senate otherwise resolve, the Senate shall meet at 11-30 A. M. on each day appointed for the meeting and the Chairman shall adjourn the meeting at 5-30 P. M., there shall be an adjournment from 2. P. M. to 3 P. M. for lunch:

Provided that if at the time prescribed for either adjournment, proceedings under closure motion are in progress, the Chairman shall not adjourn the meeting until the questions consequent thereon have been decided.

Provided also that if any voting is in progress, the voting and the proceedings consequent thereon shall be completed before the meeting is adjourned:

Provided further, that on occasions of emergency the Chairman shall have the power to suspend or adjourn the meeting at any time.

15. In the absence of the Vice-Chancellor, the Pro-Vice-Chancellor shall preside at meetings of the Senate. If neither the Vice-Chancellor nor the Pro-Vice-Chancellor is present, the members present shall elect one of the Deans to preside at that meeting.

16. (a) Twenty-five members shall be the quorum for a meeting of the Senate, ordinary or special. If a quorum is not present within fifteen minutes after the time appointed for a meeting, the meeting shall not be held, and the Registrar shall make a record of the fact.

(b) If at any time during the progress of a meeting any member shall call attention to the number of members present, the Chairman shall within a reasonable time, count the number of members present, and if a quorum be not present he shall declare the meeting dissolved, and shall leave the chair. The fact of such dissolution shall be recorded by the Registrar and the record shall be signed by the Chairman.

17. Subject to the provisions of other laws in this behalf, no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place :

Provided that the Syndicate or the Vice-Chancellor may bring any urgent business before an adjourned meeting with or without notice.

When a meeting is adjourned for fifteen days or more, not less than ten clear days' notice of the adjourned meeting and of the business to be transacted at it shall be given. Save as aforesaid, it shall not be necessary to give any notice of an adjournment or of the business to be transacted at an adjourned meeting.

18. (a) The business to be transacted at a meeting of the Senate shall be placed on the agenda paper in the following order :

(i) The answering of questions, if any,

(ii) Business brought forward by the Vice-Chancellor and the Syndicate.

(iii) Business brought forward by members of the Senate.

(b) At any meeting it shall be open to any member to move for a change in the order of business as stated in the agenda paper. If the motion for a change in the order of business is agreed to by the Senate, the business shall be transacted in the changed order.

19. At any meeting, the Chairman may, without any formal motion made, permit the correction of clerical or typographical mistakes in notices of motion or in reports or statements or other business placed before the meeting.

20. At any meeting of the Senate, any member may move any amendment to any resolution brought forward by the Syndicate or the Vice-Chancellor as an item of urgent business, or to a resolution moved by a member under Statute 11 (c) above, or to a resolution included in the agenda of a special meeting convened by the Vice-Chancellor on less than fifteen clear days' notice.

21. At any meeting of the Senate the following resolutions may be moved without previous notice :—

- (i) A resolution relating to business not included in the agenda but brought forward by the Syndicate or the Vice-Chancellor as urgent.
- (ii) A motion for a change in the order of business as stated in the agenda paper.
- (iii) A motion directing the Syndicate, a Faculty, a Board of Studies, or any Committee to review or reconsider its decision or recommendation and to report at a subsequent meeting of the Senate.
- (iv) A motion for the appointment of a committee to consider and report on any matter before the Senate at the time.
- (v) A motion remitting any matter before the Senate at the time to the Syndicate or a Faculty or a Board of studies for its consideration and report.
- (vi) A motion for the adjournment of the meeting, or the debate on any question to a specified time.
- (vii) A motion that the Senate resolve itself into a Committee to consider any matter before the Senate at the time.
- (viii) A motion that the meeting be dissolved.
- (ix) A motion that the meeting pass to the next business on the agenda paper.
- (x) A motion that the question be now put.

21. (a) At any meeting of the Senate motions of a complementary character may, without previous notice, be moved from the Chair or by any member with the previous permission of the chair.

22. At any meeting of the Senate the following amendments may be moved without previous notice:—

- (i) Amendments to motions placed before the meeting without previous notice under Statute 21 sub-sections (i) to (vi)

(ii) Amendments to any resolution or amendment on the agenda paper which, in the opinion of the Chairman, have been rendered necessary by, and are consequential upon, any motion passed by the Senate at the same meeting.

(iii) Amendments of a purely verbal or formal kind which, in the opinion of the Chairman, do not affect the sense or import of the motion to which they refer.

23. Every motion to be moved at a meeting shall be affirmative in form, and shall begin with the word 'That'.

24. Any resolution or amendment standing in the name of a member who is absent from the meeting, or who declines to move it, may be moved by any other member.

25. Every motion at a meeting must be seconded, otherwise it shall drop.

When a motion has been moved and seconded, the question shall be stated from the Chair, unless the motion be ruled out of order by the Chairman.

26. An amendment may be moved at any time after the question has been stated from the Chair and before it is put. The order in which amendments to a resolution are to be moved shall be determined by the Chairman.

27. An amendment to a resolution shall be :—

- (i) by leaving out certain words.
- (ii) by inserting or adding certain words.
- (iii) by leaving out certain words and inserting or adding others.

28. (i) An amendment must be relevant to and within the scope of the subject-matter of the motion to which it relates.

(ii) Every amendment must be so worded that, the motion as amended would form an intelligible and consistent whole.

(iii) An amendment must not reduce the original motion to its negative or opposite form.

(iv) An amendment must not be virtually an independent proposition.

(v) The Chairman may refuse to put an amendment which in his opinion is frivolous.

29. If an amendment be negatived, any other amendments to the original motion may then be moved. If an amendment be carried, the motion as amended shall be stated from the Chair and may then be

debated as a substantive motion to which the further amendments, if any, to the original motion may be moved and, such further amendments shall be disposed of in the same manner as the previous amendment.

30. When any resolution involving several points has been discussed it shall be in the discretion of the Chairman to divide the resolution, and put each or any point separately to the vote as he may think fit.

31. (i) No resolution or amendment shall be withdrawn from the decision of the meeting without its consent.

(ii) No discussion shall be permitted on a motion for leave to withdraw.

(iii) Where an amendment has been proposed to a resolution the original motion cannot be withdrawn until the amendment has been first disposed of.

32. When a resolution or an amendment has been withdrawn with the consent of the Senate, no motion raising substantially the same question shall be moved during the same session.

33. If a resolution which has been admitted is not discussed during the session, it shall be deemed to have been withdrawn.

34. The Chairman may rule a resolution or an amendment out of order at any time before the question is put to the vote.

35. A motion for a change in the order of business as stated in the agenda paper shall be made immediately after the answering of questions, if any, and before the commencement of other business. It cannot be moved at any other time.

36. A motion directing the Syndicate, or any other University authority, or Committee to review or reconsider its decision or recommendation may be made at any time during the debate on any such decision or recommendation; but shall not be made so as to interrupt a speech.

37. A motion for the appointment of a committee to consider and report upon any question before the Senate at the time may be made at any time, but not so as to interrupt a speech. The motion shall state the purpose for which the committee is to be constituted, and the names of its members and convener. The motion may include an instruction, and may also specify the date for the submission of the report.

38. A motion for the dissolution of a meeting shall be in the form "That this meeting do now dissolve," and may be made at any time but not so as to interrupt a speech.

If the Chairman shall be of the opinion that the motion for dissolution is an abuse of the rules of the meeting, he may decline to state the question thereupon to the meeting.

If the motion be carried, the business still before the meeting shall drop, and the Chairman shall declare the meeting dissolved.

39. A motion to pass to the next business, shall be in the form "That the meeting do now pass to the next business on the agenda paper," and may be moved at any time after the main question has been stated by the Chair, but not so as to interrupt a speech.

The member moving the motion shall confine himself to the words of the motion. The member who seconds the motion shall confine himself to the words "I second the motion." If the Chairman shall be of the opinion that the motion to pass over to the next item is an abuse of the rules of the meeting he may decline to put the question to the meeting. If he accepts the motion, it shall be put forthwith without amendment or debate. If the motion is carried the main question together with the amendments to it, if any, moved or given notice of shall drop.

40. A motion for closure shall be in the form "That the question be now put" and may be moved at any time, after a question has been stated from the Chair, but not so as to interrupt a speech. A member who moves the closure shall confine himself to the words, "I move that the question be now put." The member who seconds the motion shall confine himself to the words "I second the motion."

Unless it shall appear to the Chairman that such motion is an abuse of the rules of the meeting, or an infringement of the rights of the minority, or that the question before the meeting has not been sufficiently discussed, it shall be put forthwith, and decided without amendment or debate.

When the motion "That the question be now put" has been carried, the question on the original motion, the debate on which has thus been terminated, shall be put and decided without amendment or further debate :

Provided that the Chairman may allow any member any right of reply which he may have under the Statutes.

#### Speeches

41. A member can speak only when there is a question before the meeting, or when he moves or seconds a motion, except;

- (i) when putting a question, or answering a question put ;
- (ii) when speaking to a point of order ;
- (iii) when offering a personal explanation ; or
- (iv) when, with the special permission of the Chair, making a statement.



A member may speak before moving any motion which he intends to move; but he shall speak to the question and shall conclude his speech by formally moving the motion.

42. After the member who moves a motion has spoken other members may speak to the motion in the order in which they are called by the Chairman. Any member who desires to speak shall rise in his place and address himself to the Chair. In case of more than one member rising simultaneously the Chairman shall decide who is in possession of the meeting.

43. If any member who is called upon by the Chairman does not speak he shall not be entitled, except by the special permission of the Chairman to speak to the motion at any later stage of the debate.

44. Except in the exercise of the right of reply or as otherwise provided by these Statutes, no member shall speak more than once to any motion, unless with the permission of the Chairman he is making a personal explanation in which case no debatable matter may be brought forward.

45. A member who has moved a resolution may speak again by way of reply when the Chairman has ascertained that no other member entitled to address the meeting desires to speak;

Provided, however, that the mover of a resolution of the kind specified in Statute 24 or of an amendment shall have no right of reply. No member shall speak to a question after the mover has made his reply.

46. No speech shall ordinarily exceed 5 minutes in duration; provided that the mover of a resolution or of an amendment may, when moving the same, speak for 15 minutes; and provided further that the Chairman may at his discretion allow a longer period to any speaker.

47. The Chairman may at his discretion or at the request of any member explain to the meeting the scope of any resolution or amendment or make any statement on any matter arising from or connected with the proceedings of the meeting.

48. Any member may rise to explain any misconception of expressions used by him. Such personal explanations may be offered whilst another member is speaking and the member shall confine himself strictly to such explanation.

49. Any member may, even while another member is speaking, call the Chairman's attention to a point of order but he shall confine himself to statement of the point of order and shall not make a speech on it.

50. (i) When the debate on a motion is concluded, or if there be no debate, the Chairman shall put the question to the vote of the meeting.

- (ii) The manner in which the vote of the meeting shall be taken shall be left to the discretion and direction of the Chairman.
- (iii) If on the announcement by the Chairman of the result of the voting any member demands a division the same shall be allowed. The Chairman shall determine the method of taking votes by division.
- (iv) The result of a division shall be announced by the Chairman and shall not be challenged.

51. All questions shall be decided by a majority of the votes of the members present at the meeting, unless a particular majority is prescribed by the laws of the University. The Chairman shall be entitled to vote on any question. If the votes are equally divided the Chairman shall have a casting vote.

52. If the Chairman rises, the member speaking or offering to speak must sit down at once.

53. The Chairman shall be the sole judge on any point of order, and may call any member to order, and shall have all powers necessary to enforce his decisions on all points of order.

54. The Chairman may direct any member whose conduct is, in his opinion grossly disorderly, to withdraw immediately from the meeting and any member so ordered to withdraw shall do so forthwith and absent himself during the remainder of the day's meeting.

55. The Chairman may in the case of grave disorder arising at a meeting suspend the meeting for a time to be specified by him.

56. The Registrar shall prepare the minutes of the proceedings of each meeting of Senate and the minutes shall be signed by the Chairman of the meeting. A copy of the minutes so prepared and signed shall be sent to each member of the Senate and to the Government.

57. If no exception is taken by any member who was present at the meeting to the correctness of the minutes within ten days of the sending of the minutes, they shall be deemed to be correct.

58. If exception be taken within the time aforesaid by means of a letter addressed to the Registrar, definitely specifying the points which require correction in the minutes, the minutes shall be brought forward by the Syndicate at the next meeting of the Senate for confirmation or correction.

59. The proceedings of the Senate in Committee shall be governed by the same rules of debate as those of the Senate except that no notice

of a motion shall be required and that a motion need not be seconded and that a member may speak on a motion any number of times.

60. The resolutions passed at meetings of the Senate in Committee shall be embodied in a report by the Registrar, which shall be laid before the Senate at the same or at a subsequent meeting. The resolutions of the Senate in Committee shall not become final unless they are confirmed by the Senate in open meeting.

#### Questions and Answers.

61. At an ordinary meeting of the Senate any member may ask any question for the purpose of obtaining information from the Syndicate on any matter concerning the University.

62. No question shall be admitted unless it complies with the following conditions namely ---

- (i) It shall relate to a single matter ;
- (ii) It shall be so framed as to be merely a request for information ;
- (iii) It shall not contain arguments, inferences, ironical expressions or defamatory statements, nor shall it refer to the conduct or character of persons except in their official or public capacity ;
- (iv) It shall not ask for an expression of opinion or the solution of a hypothetical proposition or the solution of an abstract legal question ;
- (v) If a question contains a statement the member asking it must make himself responsible for the accuracy of the statement ;
- (vi) It shall not bring in any name or statement not strictly necessary to make the question intelligible ;
- (vii) A question once fully answered may not be asked again.

63. Any member who intends to ask a question shall forward to the Registrar a notice in writing to that effect, together with a copy of the question to be asked so as to reach him not less than twenty-one clear days before the date of an ordinary meeting.

64. The Registrar shall submit every question, of which notice has been given to him, to the Vice-Chancellor who may either allow it or when any question is not framed in accordance with Statute 62 above, may either himself amend it in such a way as to render it admissible or may cause it to be returned to the member concerned for the purpose of amendment.

If the member does not within such time as may be fixed by the Vice-Chancellor re-submit the question duly amended, the question shall be deemed to have been withdrawn.

65. The Vice-Chancellor shall decide on the admissibility of a question and shall disallow any question or any part of a question which in his opinion;—

- (i) contravenes the provisions of these Statutes; or
- (ii) cannot be answered consistently with the interests of the University; or
- (iii) amounts to an abuse of the right of questioning.

The decision of the Vice-Chancellor shall be final and no discussion thereon shall be permitted.

66. Questions which have been admitted and the answers thereto shall be printed and circulated to the members of the Senate along with the amended agenda.

67. Any member may put a supplementary question for the purpose of further elucidating any matter of fact regarding which an answer has been given provided that the Chairman shall disallow any supplementary question if, in his opinion, it infringes the Statutes relating to questions. The decision of the Chairman shall be final and no discussion shall be permitted thereon.

68. No discussion shall be permitted in respect of any question or of any answer given to a question.

## CHAPTER IV.

### THE SYNDICATE

1. The two representatives of the Private Colleges referred to in Section 16 (iv) of the Act shall be the Principal of the Union Christian College, Alwaye, and the Principal of the St. Berchmans' College, Changanacherry.

2. The election of the two representatives of the Senate on the Syndicate under Section 16 (v) of the Act shall be conducted in accordance with the Statutes framed in this behalf.

3. The Syndicate shall meet ordinarily once in two months, and at other times when convened by the Vice-Chancellor.

4. The Vice-Chancellor or in his absence the Pro-Vice-Chancellor shall preside at meetings of the Syndicate. In the absence of the Vice-Chancellor and the Pro-Vice-Chancellor, the Syndicate may elect a Chairman for the meeting.

5. Six members shall constitute a quorum.

6. (a) The Syndicate shall submit to Government, [within twenty-one days of a meeting a copy of the proceedings of that meeting.

(b) The Syndicate shall also submit to Government, copies of the proceedings of the Senate.

7. The Syndicate shall, in addition to the powers and duties conferred and imposed on it by the Act, and subject to the provisions thereof, have and exercise the following powers and functions:—

- (i) to determine from time to time the number of Professors Assistant Professors, Readers, Lecturers and other officers necessary for the Colleges and other institutions maintained by the University;
- (ii) to make appointments to all posts carrying a pay or maximum pay exceeding Rs. 150 per mensem but not exceeding Rs. 300 per mensem, and to dismiss, suspend or otherwise punish any person whom it is competent to appoint; and to recommend to the Government persons for appointment to posts carrying a salary exceeding Rs. 300 per mensem.
- (iii) to fix the remuneration and the travelling and other allowances payable to persons engaged in University business;
- (iv) to manage and regulate the finances, accounts, investments, property, business and all other executive affairs of the University, and for the purpose to appoint such agents as it may think fit;
- (v) to cause proper accounts to be maintained relating to the University Fund;
- (vi) to invest with the approval of Government any moneys belonging to the University in such stocks, shares, funds or securities as it may from time to time deem fit, or in the purchase of immovable property in Travancore;
- (vii) to enter into, vary, carry out and cancel contracts on behalf of the University;
- (viii) to provide buildings, premises, furniture, apparatus and such other requirements for carrying on the work of the University;
- (ix) to appoint Boards of Examiners after considering the recommendations of the Boards of Studies and of the Faculties;
- (x) to make arrangements for the administration and management of:—
  - (a) the University Library,
  - (b) the University Extension Lectures,
  - (c) the University Publication Department,

- (d) the University Union,
- (e) the Students' Information Bureau and of such other institutions or departments of work as may be established by the University;
- (xi) to co-operate with other Universities or any authorities or associations for the purpose of carrying out the objects of the University;
- (xii) to take over any institution transferred by Government to the maintenance and control of the University and to administer it in accordance with the terms and conditions of the transfer ;
- (xiii) to exempt by a special order and on such conditions as the Syndicate may think fit, a candidate for a University Examination from being an enrolled member of a College;
- (xiv) to take cognizance of any misconduct by any student of a College or of any University institution or by any candidate for any University Examination, brought to the notice of the Syndicate by the head of the institution or by a Member of any Authority of the University, or by the Registrar or by a Chairman of a Board of Examiners or by a Chief Superintendent at any Centre of Examination, and to punish such misconduct by expulsion from the College or other Institution, or by exclusion from any University Examination either permanently or for a specified period, or by cancelling any University Examination or by deprivation of any University Scholarship or endowment held by the person guilty of such misconduct;
- (xv) to refer any matter to the Senate or a Faculty or a Board of Studies and to call for a report thereon;
- (xvi) to remit for further consideration any proposal or recommendation made to it by the Senate or a Faculty or a Board of Studies or any other Authority of the University;
- (xvii) to make recommendations to the Senate, or in special cases to the Chancellor, regarding the conferment of honorary degrees.

8. In framing ordinances relating to Course of Study and other academic matters, the Syndicate shall consult the Faculties concerned and consider their recommendations before passing the Ordinances.

9. The minutes of the Syndicate shall, after they are duly confirmed, be circulated to members of the Senate and of the Faculties.

## CHAPTER V.

## FACULTIES.

The following shall be the Faculties in the University:—

- (i) The Faculty of Arts.
- (ii) The Faculty of Science.
- (iii) The Faculty of Technology.
- (iv) The Faculty of Oriental Studies and Fine Arts.
- (v) The Faculty of Education.
- (vi) The Faculty of Law.
- (vii) And such other Faculties as the Senate may institute from time to time.

2. (a) Each Faculty shall comprise such Departments of Study as may be prescribed by the Ordinances.
- (b) Each Faculty shall consist of a Dean who shall be the head of the Faculty and not less than six and not more than twenty-four other members.
3. (a) The Chairmen of the Boards of Studies in the subject comprised in a Faculty shall be ex-officio members of that Faculty.
- (b) Of the remaining members of a Faculty, one-third shall be nominated by the Vice-Chancellor in consultation with the Dean of that Faculty and the other two-thirds shall be appointed by the Syndicate from among persons recommended by the Boards of Studies in the subjects comprised in that Faculty.
- (c) A person may be a member of more than one Faculty.
- (d) The Dean of the Faculty shall be nominated by the Vice-Chancellor from among the Heads of the Departments of study comprised in the Faculty.

4. Each Faculty shall be reconstituted once in three years. Any casual vacancies that may arise may be filled up by the Syndicate and a member appointed to fill such a vacancy shall hold office for the remaining portion of the said term of three years.

5. The Dean shall be the executive officer of the Faculty and shall exercise general superintendence over the organisation of studies in the subject comprised in the Faculty. He shall ordinarily preside at meetings of the Faculty. In the absence of the Dean the members present shall elect a Chairman.

6. (a) Every Faculty shall meet at least once every academic year.
- (b) Every meeting of a Faculty shall be convened by the Dean of that Faculty, or in his absence, by the Registrar,

(c) The Vice-Chancellor may, at any time, require a meeting of any Faculty to be convened.

(d) The Vice-Chancellor may require two or more Faculties to hold a joint meeting for the disposal of any questions affecting more than one Faculty. In such cases the joint meeting shall be convened by the Registrar and shall be presided over by the Vice-Chancellor or in his absence, by a person nominated by him.

7. Fifteen clear days' notice shall be given of meetings of a Faculty.

8. (a) The quorum for the meeting of Faculty shall be one-third of the members of the Faculty.

(b) The quorum for a joint meeting of two or more Faculties shall be one-third of the total number of members in the said Faculties no one member, however, being counted more than once.

The conduct of business at meetings of Faculties shall be regulated in accordance with the statutes governing meetings of the Senate in so far as they are applicable.

9. A Faculty shall have the following functions:--

(a) to consider and report on any matter referred to it by the Senate, the Syndicate or the Vice-Chancellor;

(b) to make recommendations to the Syndicate in all matters relating to the organisation of University teaching, courses of study, examinations, and research in the subject of study comprised in it and to propose additions or amendments to the Ordinances relating to these matters for the consideration of the Syndicate;

(c) to recommend to the Syndicate the names of persons suitable for appointment as Examiners in the subjects assigned to the Faculty;

(d) to call for proposals from the Board of Studies in the subjects comprised in it regarding syllabuses and text-books for the courses of study;

(e) to remit any matter to the Board of Studies concerned for consideration and report;

(f) to appoint Committees of the Faculty to consider and report on matters referred to them;

(g) to recommend to the Vice-Chancellor the holding of joint meeting of two or more Faculties to consider any matter of common interest to them.

10. Each Faculty shall consider at its annual meeting the recommendations made by the Boards of Studies regarding text-books and



syllabuses, and prescribe the text-books and syllabuses for the courses and examinations relating to the subjects assigned to that Faculty.

11. Within two weeks after a meeting of a Faculty the minutes of the meeting shall be prepared and forwarded by the Registrar to the members of the Faculty. Any member of the Faculty who was present at the meeting may within 10 days of the issue of the minutes communicate to the Registrar any exception he may take to the correctness thereof. The minutes together with the exceptions taken, if any, shall be laid before the next meeting of the Faculty for confirmation.

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## CHAPTER VI.

### REGISTER OF GRADUATES.

1. The Syndicate shall maintain a Register in which a graduate of any of the following classes may have his name entered:-

(a) A Graduate of the University of Travancore who became eligible for a degree not less than five years before the date of application for registration, and who has taken the degree.

(b) A Graduate of any other University in India or in the United Kingdom who is a Travancorean or is residing in Travancore and who became eligible for his degree not less than five years before the date of application for registration.

(c) Holders of Honorary Degrees of the Travancore University.

2. The fee for registration shall be Bh. Rs. 5 for life and shall be paid along with the application for registration which shall be in the form prescribed for the purpose.

3. The Register of Graduates shall be revised and corrected on the first day of Chingom of each year. Applications for revision or correction shall reach the Registrar not later than the first day of Karkadakom preceding.

4. Every registered graduate shall have his name retained on the Register during his lifetime unless removed therefrom under the provisions of Section 6 of Chapter 3 of the Statutes.

5. Any graduate may inspect the Register of Graduates during office hours on application to the Registrar, and may obtain, on payment of two Rupees, a copy of a complete list of registered graduates.

## CHAPTER VII.

### REGISTER OF DONORS.

1 The Syndicate shall maintain a Register showing:—

(i) the names and addresses of all persons who have contributed not less than Rupees ten thousand or transferred property of the like value to the University Fund for the general purposes of the University ;

- (ii) the name and address of every association that undertakes to make to the University an annual contribution of Rs. 1,000 (one thousand) or more, and the period for which such undertaking is given.

## CHAPTER VIII. DEGREES.

1. The University may confer the following degrees ;—

1. Bachelor of Arts	...	B. A..
2. Bachelor of Science	...	B. Sc
3. Bachelor of Arts (Honours)	...	B. A. (Hons.)
4. Bachelor of Science (Honours)	...	B. Sc. (Hons.)
5. Bachelor of Science (Engineering)	...	B. Sc. (Eng.)
6. Licentiate in Teaching	...	L. T.
7. Bachelor of Laws	...	B. L.
8. Master of Arts	...	M. A.
9. Master of Science	...	M. Sc.
10. Master of Laws	...	M. L.
11. Doctor of Philosophy	...	Ph. D.
12. Doctor of Letters	...	D. Litt.
13. Doctor of Science	...	D. Sc.
14. Doctor of Laws	...	LL. D.
15. Such other degrees as the Senate may from time to time institute		

2. The University may grant diplomas and certificates in the following subjects of study :—

1. Mechanical Engineering.
2. Electrical Engineering.
3. Civil Engineering.
4. Geography.
5. Architecturc.
6. Textile Technology.
7. Textile Chemistry.
8. Fine Arts.
9. Forestry.
10. Such other subjects of study as the Senate may decide on from time to time.

3. The University may confer the following Titles in Oriental Studies :—

1. Mahopadhyaya (Sanskrit).
2. Sahitya Visarada (Malayalam).
3. Vidvan (Tamil).

4. Candidates for the Bachelor of Arts (B. A.) and Bachelor of Science (B. Sc.) Degrees shall be required to have undergone the prescribed course of study for a period of not less than two academic years

after passing the Intermediate Examination or an Examination accepted by the Syndicate as equivalent thereto, in a College of this University and passed the Bachelor of Arts or Bachelor of Science Degree Examination, as the case may be, conducted by this University.

5. Candidates for the Degrees of Bachelor of Arts (Honours) [B. A. (Hons.)] and Bachelor of Science (Honours) [B. Sc. (Hons.)] shall be required to have undergone the prescribed courses of study for a period of not less than three academic years after passing the Intermediate Examination, or an examination accepted by the Syndicate as equivalent thereto and to have passed the B. A. (Hons.) or B. Sc. (Hons.) Examination, as the case may be, conducted by this University.

6. Candidates for the M. A. and M. Sc. Degrees shall be required to have undergone the prescribed courses of study for a period of not less than two years, after passing the B. A. or B. Sc. Degree Examination of this University or an Examination accepted by the Syndicate as equivalent thereto, and to have passed the M. A. or M. Sc. Degree Examination, as the case may be, of this University ; provided that :—

(i) A candidate who has qualified for the B. A. (Hons.) Degree of this University by passing the prescribed Examination may, without further Examination, but upon payment of the prescribed fee, proceed to take the M. A. Degree of this University at any Convocation subsequent to his taking the B. A. (Hons.) Degree ;

(ii) A candidate who has qualified for the B. Sc. (Hons.) Degree of this University by passing the prescribed Examination may, without further Examination, but upon payment of the prescribed fee proceed to take the M. Sc. Degree of this University at any Convocation subsequent to his taking the B. Sc. (Hons.) Degree ;

(iii) The Master of Science Degree may also be awarded on the results of meritorious research work conducted under conditions prescribed by the University.

7. The Degrees of Doctor of Philosophy (Ph. D.), Doctor of Science (D. Sc.), Doctor of Letters (D. Litt.) and Doctor of Laws (LL. D.) may be awarded on the results of meritorious research work carried out under the conditions prescribed by the University.

8. No candidate shall be eligible for the Degree of Bachelor of Laws (B. L.) unless he has taken the Degree of B. A. or B. Sc. in this University or a Degree in any other University accepted by the Syndicate as equivalent thereto, and has undergone for a period of two years the prescribed courses of study and passed the prescribed Examinations.

9. No candidate shall be eligible for the Degree of Licentiate in Teaching (L. T.) unless he has taken a Degree in this University or a

Degree in some other University accepted by the Syndicate as equivalent thereto, and has undergone the prescribed course for a period of one academic year and passed the prescribed examination.

10. Candidates for the Degree of Bachelor of Science (Engineering) [B. Sc. (Eng.)] shall be required to have undergone the prescribed course of study in the Engineering College of the University for a period of not less than four academic years after passing the Intermediate Examination or any other Examination accepted by the Syndicate as equivalent thereto, and to have undergone a fifth year of approved practical training after passing the B. Sc. (Eng.) Degree Examination conducted by this University.

## CHAPTER IX.

### HONORARY DEGREES.

1. On the recommendation of the Syndicate, an honorary degree shall be conferred on any person who by reason of his eminent position and attainments, or by virtue of his contribution to learning, or eminent services to the cause of education, is a fit and proper person to receive such a degree: provided that such recommendation is accepted by not less than two thirds of the members present at a meeting of the Senate, and is confirmed by the Chancellor:—

Provided that it shall be competent to the Chancellor to award honorary degrees in special cases on the recommendation of the Syndicate only.

2. Honorary degrees shall be conferred only at a Convocation and may be taken in person or *in absentia*.

3. The presentation at the Convocation of persons on whom honorary degrees are to be conferred shall be made by the Vice-Chancellor or, in his absence, by a member of the Senate nominated by the Syndicate.

4. The diploma or certificate for an honorary degree shall be signed by the Chancellor.

5. The following shall be the degrees to be conferred as Honorary Degrees :

Doctor of Science	...	D. Sc.
Doctor of Letters	...	D. Litt.
Doctor of Laws	...	LL. D.

## CHAPTER X.

### WITHDRAWAL OF DEGREES, DIPLOMAS ETC.

If evidence is laid before the Syndicate to show that any person, on whom a degree, title or other distinction has been conferred or to

whom a diploma, license or certificate has been granted by the Senate, has been convicted of what is in their opinion an offence involving moral turpitude, the Syndicate may propose to the Senate that the degree, diploma, title, license, certificate or other distinction should be cancelled and if the proposal is accepted by not less than two-thirds of the members present at a meeting of the Senate, and is confirmed by the Chancellor, the degree, diploma, title, license, certificate or other distinctions shall be cancelled accordingly.

## CHAPTER XI.

### LEGISLATION.

1. The laws of the University shall consist of the Act, the Statutes, the Ordinance, the Bye-laws and the Rules.

2. The draft of any Statute referred to the Syndicate under section 24 (b) of the Act shall be again presented to the Senate together with the report of the Syndicate thereon, and the Senate may then deal with the draft in any manner it thinks fit.

3. In making Ordinances relating to : (a) courses of study (b) admission of students to the various courses of study and to the examinations, (c) qualifications of teachers (d) appointment and prescription of the duties of Boards of Studies and Boards of Examinations (e) institution of Departments of teaching or research, the Syndicate shall consult the Faculty or Faculties concerned and obtain their opinion before the Ordinances are passed.

4. Ordinances may be made, amended or repealed by the Syndicate on its own initiative or on a reference from the Senate, or a Faculty or other University Authority.

5. All Ordinances made by the Syndicate shall be submitted to the Government for approval and may be given effect to from such date as the Syndicate may direct with the sanction of Government.

6. All Ordinances passed by the Syndicate shall be placed before the Senate at its next succeeding meeting and the Senate shall have power by a resolution passed by a majority of not less than two-thirds of the members present to cancel any such Ordinance.

7. The Syndicate shall have power to frame rules not inconsistent with the provisions of the Act, the Statutes and Ordinances, to regulate the management of any institution under its control or the conduct of any business falling within its purview.

## CHAPTER XII.

## PRIVATE COLLEGES.

1. Private Colleges shall have the following privileges :—

(i) Every Private College shall be entitled to prepare and present students, in accordance with the Statutes and Ordinances, for the examinations of the University in the subjects of study for which it was affiliated to the University of Madras during the academic year 1937-38.

(ii) Students and teachers of private Colleges shall be eligible for membership of the University Library, the University Union, the University Athletic Club and other such institutions, subject to the rules governing those institutions.

(iii) Private Colleges shall have the same freedom in regard to religious education and religious and social activities generally, as they had under the University of Madras and the Travancore Education Code.

(iv) Private Colleges shall be entitled to financial aid from the Government, and the funds placed at the disposal of the University by Government for this purpose shall be administered by the Vice-Chancellor in accordance with the rules framed by him.

2. (a) Every Private College shall be under the management of a regularly constituted Governing Body on which the teaching staff is represented by at least the Principal.

(b) Any change in the constitution of the Governing Body shall be reported forthwith to the Syndicate.

3. Every College shall have a duly-constituted College Council properly representative of the teaching staff, to advise the Principal in the internal affairs of the College.

4. Every College shall satisfy the Syndicate on the following points :—

- (i) that the buildings, libraries, laboratories and other equipments provided are adequate and suitable ;
- (ii) that the character, qualifications and strength of the teaching staff, and the conditions governing their appointment and tenure of office are such as to ensure adequate provision for the courses of instruction undertaken by it ;
- (iii) that adequate provision is made for the residence, physical welfare, discipline and supervision of its students ;
- (iv) that all other matters essential for the maintenance of the tone and standards of University education are duly provided for ;
- (v) that the financial resources of the institution are such as to make due provision for its continued and efficient maintenance ;

(vi) that the fees payable by the students have not been so fixed as to involve unfair competition with any other College in the State or as would be injurious to the interest of education ;

(vii) that no student of the College is compelled to attend any classes or discourses in a religion which is not his own.

5. All appointments to the teaching staff shall be made in accordance with the requirements of the University, and shall be reported to, and be subject to the approval of, the Syndicate.

6. The following registers and records in the forms that may be prescribed by the Syndicate shall be maintained by each College, and in every case in which a school forms a part of the institution, they will be maintained distinct from those kept for the school departments--

(a) A register of admissions and withdrawals.

(b) A register of attendance.

(c) A register of attendance at Physical training.

(d) A register or other record of addresses of students.

(e) A register of the members of the staff showing their qualifications, previous experience, salaries, number of hours of work and classes and the subjects taught.

(f) A register of fees paid showing dates of payments.

(g) A counterfoil fee receipt book.

(h) A register of scholarships and concessions of all kinds whether of tuition, boarding or lodging.

(i) A counterfoil book of transfer certificates.

(j) A counterfoil book of certificates of medical inspection of students.

(k) A register of marks obtained by each student at the College Examinations.

(l) Account books showing the financial transactions of the College as separate from those of the management. The accounts shall show the transactions.

7. Every College shall furnish such returns and other information as may be required by the Syndicate to enable it to judge of its efficiency, and shall take such action as the Syndicate may consider necessary to maintain its efficiency.

8. The Vice-Chancellor or the Syndicate may, at any time, direct an inspection to be conducted of any or all of the Private Colleges ; and the report of such inspection shall be forwarded to the Principals of the institutions concerned and their explanations shall be called for before any action is taken on it. The Syndicate may, after considering

the explanations, if any, issue to the Colleges such instructions as it may think fit, and the Colleges shall, within such period as may be fixed take such action as the Syndicate may specify.

9. Where a College desires to institute additional courses or subjects of instructions (including courses of a higher standard) an application for permission to make such addition shall be made to the Syndicate. All such applications shall reach the Registrar not later than the 30th of Chingom preceding the academic year in which instruction in additional subject or courses is proposed to be started.

10. (a) The letter of application shall contain sufficient information to satisfy the Syndicate that, so far as the additional courses of instruction are concerned, adequate provision is made in respect of the matters specified in section 4 above.

(b) Along with the letter of application the College shall also forward to the Syndicate a written undertaking that it will pay to the University a fee calculated at the rate of Bh. Rs. 100 for each member of the Inspection Commission that may be appointed by the Syndicate to inspect the College and report on the question of the opening of new courses or subjects of instruction.

11. (a) On receipt of an application for opening new courses or subjects of instruction the Syndicate may direct a local enquiry to be made by a competent person or persons concerning the arrangements made or proposed to be made by the College in respect of buildings, equipment, staff and other matters and also on the desirability of the opening of the proposed courses in view of the provision made for the same courses or subjects of study in other Colleges.

(b) The College shall pay to the University the fee for the Inspection Commission within fifteen days of the receipt of the requisition from the Syndicate, and if the fee be not paid, the Syndicate may on that ground reject the application.

12. When a College has been permitted to give instruction in a number of optional subjects, the College shall be at liberty to provide instruction in any combinations of them provided it satisfies the Syndicate that the accommodation and staff are adequate whenever a fresh combination is proposed to be introduced.

13. The Syndicate may grant provisional permission for the opening of new courses or subjects of study in a College. In such a case the period for which the permission is given and the conditions to be fulfilled by the College before the expiry of the said period shall be specified in the orders of the Syndicate. If the conditions are not fulfilled by the College within the period fixed, the provisional permission given shall be deemed to have ceased automatically on the expiry of the period.



14. An application for permission to open fresh courses or subjects of instruction may be withdrawn at any time before the Syndicate has passed order on it :

Provided that in cases where the University has already incurred expenditure on an inspection Commission the College shall not be entitled to a refund of the fee paid.

15. Where the Syndicate finds that the conditions laid down in these Statutes are not satisfied by a College and that no satisfactory assurance of compliance with these conditions is given by the Management of that College, the Syndicate may propose to the Senate that the institution be deprived of the privileges of the University. If the Senate agrees to the proposal, the Vice-Chancellor shall recommend to Government that the College in question be excluded from the privileges of the University and if the Government after such enquiry, if any, as they consider necessary accept the recommendation, the College shall be deprived of the privileges of the University and the Vice-Chancellor shall issue an order accordingly.

## CHAPTER XIII.

### CONVOCATION.

1. A Convocation of the body corporate of the University for the purpose of conferring degrees shall be held annually at Trivandrum in the month of Thulam (October—November).

2. Special Convocation may be held at such times as the Chancellor may direct.

3. Every Convocation, Annual or Special, shall be summoned on such date as the Chancellor may appoint for the purpose.

4. The Chancellor or the Pro-Chancellor or in the absence of both, the Vice-Chancellor, shall preside at Convocations.

5. The Registrar shall notify the date of the Annual Convocation at least four weeks before the date fixed for the Convocation.

6. The Chancellor may appoint an eminent person to address the graduates at a Convocation.

7. Degrees may be taken in person or *in absentia*.

8. A candidate applying for a degree in person shall pay a fee of Rs. Three. A candidate applying to be admitted to a degree *in absentia* shall pay a fee of Rs. Ten.

9. A candidate for a degree shall forward his application in the prescribed form to the Registrar so as to reach him not less than fifteen clear days before the date fixed for the Convocation.

10. (i) Officers of the University shall appear at Convocation in the robes prescribed for them.

(ii) Members of University authorities shall appear in the robes to which they are entitled by virtue of the degrees they hold of this University or of any other University or in the robes prescribed by the Statutes.

(iii) A candidate for a degree shall wear the robes prescribed for the degree to which he seeks admission.

11. There shall be a meeting of the Senate preliminary to the Convocation at which the graces of the Senate shall be supplied on behalf of the candidates for admission to the several degrees by the Dean of each Faculty or in his absence by a member of the Senate nominated for the purpose by the Syndicate.

12. The formula to be used for each grace shall *mutatis mutandis* be as follows :

..... Chancellor, I move that a grace of the Senate be passed that those persons whom the Syndicate on the reports of the Examiners has certified to be qualified for the degree of ..... be admitted to that degree.

13. On each motion for the grace of the Senate the Chancellor shall put the question "Doth it please you that this grace be passed?" and the Senate assenting, the Chancellor shall say "This grace is passed."

14. When all the graces have been passed, the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Pro-Vice-Chancellor and the Members of the Senate shall proceed in procession to the hall where the Convocation is to be held.

15. On the procession entering the hall, the candidates and others present in the hall shall rise and remain standing until the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Pro-Vice-Chancellor and Members of the Senate have taken their seats.

16. After the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Pro-Vice-Chancellor and Members of the Senate have taken their seats the Chancellor, or if authorised by him, the Vice-Chancellor, or the Pro-Vice-Chancellor shall say :—

"This Convocation of the University of Travancore has been called to confer degrees upon (persons on whom the Senate has decided to confer honorary degrees) the candidates who have been certified to be worthy of the same. Let the candidates stand forward."

17. The candidates standing, the Chancellor, or if authorised by him the Vice-Chancellor or the Pro-Vice-Chancellor, shall put to them the following question :—

*Question.* Do you sincerely promise and declare that, if admitted to the degrees for which you are severally candidates, and for which you have been recommended, you will in your daily life and conversation, conduct yourselves as becomes members of this University ?

*Answer.* I do promise.

*Question.* Do you promise that to the utmost of your opportunity and ability you will support and promote the cause of morality and sound learning?

*Answer.* I do promise.

*Question.* Do you promise that you will, as far as in you lies, uphold and advance social order and the well-being of your fellow-men?

*Answer.* I do promise.

In the case of candidates for professional degrees, the following addition shall be made:—

*Question.* Do you promise that you will faithfully and carefully fulfil the duties of the professions for which you have qualified yourselves, that you will, on all occasions, maintain their purity and reputation, and that you will never deviate from the straight path of their honourable exercise by making your knowledge subservient to unworthy ends?

*Answer.* I do promise.

13. Then the candidates shall be presented to the Chancellor by the heads of their respective Colleges, being members of the Senate, or by other members of the Senate nominated for the purpose by the Vice-Chancellor, the candidates having first received their diplomas from the Registrar.

19. When all the candidates for the same degree have been presented, the chancellor shall say to the candidates, who shall remain standing,

By virtue of the authority vested in me as Chancellor/Pro-Chancellor/Vice-Chancellor of the University of Travancore, I admit you to the degree of . . . . . in this University, and in token thereof you have been presented with these diplomas, and I authorise you to wear the robes ordained, as the insignia of your degree.

20. When all the candidates have been presented, the Registrar shall lay the record of the degrees that have been conferred, before the Chancellor, who shall sign the same.

21. An address may then be made to the candidates by the person appointed by the Chancellor for the purpose.

22. The address being ended, or, if there is no address, after the record has been signed, the Chancellor shall dissolve the Convocation.

23. The Convocation being dissolved, the Chancellor, the Pro-Chancellor, the Vice-Chancellor, the Pro-Vice-Chancellor and Members of the Senate shall retire in procession in the same order in which they entered, the graduates standing.

24. Sections 8, 9, 11, 12, 13, 14, 15, 17, 18 and 21 shall not apply to a Convocation held for the purpose of conferring honorary degrees only.

## CHAPTER XIV.

## RESEARCH DEGREES.

1. The following Degrees may be awarded for meritorious research work :—

- (i) Master of Science : M. Sc.
- (ii) Doctor of Philosophy : Ph. D.
- (iii) Doctor of Science : D. Sc.
- (iv) Doctor of Letters : D. Litt.

## Master of Science.

2. This Degree will be awarded to graduates of a recognised University and others as prescribed hereunder on the results of research work as embodied in a thesis relating to subjects within the purview of the Faculty of Science and the Faculty of Technology.

(a) To graduates, on the results of research work extending over a period of not less than three years after passing the examination qualifying them for the Bachelor's Degree.

(b) To others, not possessing a First Degree of a recognised University, on the results of research work extending over a period of not less than four years.

3. Candidates for the M. Sc. Degree shall be required to register themselves as Research Students before the commencement of their course of research.

4. Application for registration as a Research Student and as a Candidate for the Degree shall be made to the Registrar in the prescribed form and must be accompanied by—

(a) a diploma or certificate showing the academic qualifications of the applicant and such other evidence of the attainments of the applicant as will show his fitness to pursue the proposed course of research, and

(b) a written consent of a recognised Teacher of the University agreeing to supervise the work of the applicant.

5. The application shall be considered and disposed of by the Syndicate, provided, however, that the application of persons not possessing a First Degree shall be forwarded, in the first instance, to the Board of Studies dealing with the subject of the proposed research, for opinion. The Board of Studies shall not recommend such application favourably unless they are satisfied that :

(a) the applicant's knowledge of English is adequate for the purposes of the proposed research, and

(b) the course of research selected is such as can be pursued in the University, and the applicant possesses exceptional aptitude for conducting it.

6. Within six months before the expiry of the prescribed minimum period after registration, or at any other time afterwards, the candidate may submit to the Registrar, together with the prescribed fee four copies of a thesis, printed or type-written in English, embodying the results of research carried out by him. The candidate shall state, in a preface, the sources from which he has derived information or guidance for his work, the extent to which he has availed himself of the work of others and the portions of the thesis which he claims as original. He shall be required to declare that the thesis is not substantially the same as has been already submitted by him for a Degree, Diploma or Title of any other University or Society and shall submit a report by the Supervising Teacher certifying that the thesis is a record of *bona fide* research carried out by the candidate.

7. In addition to the thesis, the candidate may submit, as additional evidence any memoir or work published by him, alone or jointly with others. The thesis shall be valued by a Board of three Examiners appointed for the purpose by the Syndicate. The candidates may be required to undergo, at the direction of the Examiners an oral and/or practical test on the subject of the thesis.

8. The report of the Examiners shall be considered by the Syndicate. If the candidate is adjudged worthy to be awarded the Degree, a resolution to that effect will be passed by the Syndicate and the candidate will be admitted under the usual conditions.

9. If a thesis is not approved for the award of the Degree, the candidate may submit, after an interval of not less than one year, a new or a revised thesis, together with the same fee. The procedure prescribed above will be followed in respect of this thesis also.

#### Degree of Doctor of Philosophy.

10. This degree will be awarded, as prescribed hereunder, to persons holding a Master's Degree of a recognised University on the results of research work, as embodied in a thesis relating to subjects coming within the purview of the Faculties of Arts, Science, Technology, and Oriental Studies and Fine Arts:—

(a) To Masters of Arts or Science on the results of research work extending over a period of not less than three years after passing the examination qualifying them for the Master's Degree.

(b) To Masters of Science by Research on the results of further research work carried out in an approved institution, within

Travancore or outside, extending over a period of not less than two years after the submission of the thesis for which the Degree was awarded.

11. A person not possessing a Research Degree shall be required to register himself as a Research Student and candidate before the commencement of his course of research.

12. Application for registration as a Research Student and as a candidate for the Ph. D. Degree shall be made to the Registrar in the prescribed form and must be accompanied by :—

(a) a diploma or certificate showing the academic qualifications of the applicant and such other evidence of attainments as will show his fitness to pursue the proposed course of research, and

(b) a written consent of a Teacher of the University, recognised for the purpose by the Syndicate, agreeing to supervise the work of the applicant.

13. A person possessing a previous Research Degree shall be required to register himself as a candidate for the Ph. D. Degree.

14. Application for registration as a candidate for the Ph. D. Degree shall be made to the Registrar in the prescribed form and must be accompanied by :

(a) a diploma or certificate showing the academic qualifications of the applicant and such other evidence of attainments as will show his fitness to pursue the proposed course of research, and

(b) a statement giving the name of the institution where he proposes to carry out his research and such particulars regarding the equipment and facilities as will show that it is adequately equipped for the purposes of the proposed research.

15. The application for registration as Research Student and candidate for the Degree, or for Registration as candidate for the Degree shall be considered and disposed of by the Syndicate, provided, however, that the opinion of the Board of Studies concerned shall be obtained with regard to the suitability of the institution, if outside Travancore, for the purposes of any particular course of Research.

16. The procedure for the submission of the thesis and the award of the Degree shall be the same *mutatis mutandis*, as for the Master's Degree by Research.

#### Degrees of Doctor of Science and Doctor of Letters.

17. These Degrees will be awarded to persons holding the Degree of Doctor of Philosophy of a recognised University on the results of Research work carried out in an approved institution, within Travancore or outside, and extending over a period of not less than two years after registration as candidates,

18. The D. Sc. Degree will be awarded if the thesis relates to subjects within the purview of the Faculties of Science or Technology and the D. Litt. Degree will be awarded if the thesis relates to subjects within the purview of the Faculties of Arts, and Oriental Studies and Fine Arts.

19. The application for registration as candidate for the D. Sc. or D. Litt. Degree shall be made, in the prescribed form, to the Registrar and must be accompanied by :-

(a) a diploma or certificate showing the academic qualifications of the applicant and such other evidence of attainments as will show his fitness to pursue the proposed course of research, and

(b) a statement giving the name of the institution where he proposes to carry out his research and such particulars regarding the equipment and facilities as will show that the institution is adequately equipped for the proposed research.

20. The application for registration as a candidate for the D. Sc. or D. Litt. Degree shall be considered and disposed of by the Syndicate, provided, however, that the opinion of the Board of Studies concerned shall be obtained with regard to the suitability of the institution, if outside Travancore, for the purposes of any particular course of research.

21. The procedure for the submission of the thesis and the award of the D. Sc. or D. Litt. Degree shall be the same, *mutatis mutandis*, as for the Master's Degree by Research, provided, however, that the candidates shall be required to submit, along with the thesis, four copies of papers, memoirs or books published by the candidate in journals or proceedings of Learned Societies of standing.

## CHAPTER XV.

### Colleges maintained by the University.

1. The Colleges transferred to the University by the Government under Section 20 (a) of the Act shall be maintained by the University in accordance with the Statutes and Ordinances, and the Syndicate shall be responsible for the proper management of these Colleges.

2. No Department of Study for which provision was made by Government in these Colleges during the academic year 1937-38 shall be abolished by the University without the previous sanction of Government.

3. The Government shall give to the University, for the maintenance of these Colleges an annual grant of a sum not below the net expenditure incurred by Government on account of these Colleges during the year 1113 M. E. and shall also provide funds for the natural and legitimate expansion of these Colleges.

4. The Syndicate shall make provision in the Colleges maintained by the University for such additional departments of study or research as the Government may direct and provide funds for.

5. All fees collected from the students of the Colleges maintained by the University shall be credited to the University.

6. It shall be competent to the Syndicate to make such redistribution of the subjects of study provided for in the College as it may, from time to time, deem necessary; provided that such redistribution does not involve additional recurring expenditure.

7. The Vice-Chancellor shall have power to order any redistribution he considers necessary, of the books, furniture, equipment and all other movable property attached to the Colleges and other institutions maintained by the University.

8. The Vice-Chancellor shall have the power to transfer any member of the teaching, clerical or menial staff attached to these Colleges from one institution to another and also to transfer from one institution to another any post, teaching, clerical or menial.

9. The Principal of a College shall be responsible to the Vice-Chancellor for the maintenance of discipline in the College and for the management of the internal affairs of the College.

The Principal shall be assisted in the internal administration of the College by a Council. The Syndicate shall be competent to lay down from time to time, such rules as it deems fit for the constitution and working of the College Councils.

10. It shall be competent to the Vice-Chancellor to issue such instructions as he may deem fit to the Principals of Colleges in the matter of regulating the admission of students and the residence, welfare and discipline of students.

#### **The Law College.**

11. A Board called the "Law College Advisory Board" shall be constituted for the purpose of advising the University on all matters relating to the College.

12. The Law College Advisory Board shall consist of;---

(i) The Chief Justice of the High Court of Travancore (President Ex-officio.)

(ii) The Dean of the Faculty of Law (Ex-officio),

(iii) A Judge of the High Court of Travancore, nominated by the Vice-Chancellor.



- (iv) The Advocate-General of Travancore (Ex-officio).
- (v) Two members nominated by the Vice-Chancellor, of whom one at least shall be a member of the Bar.
- (vi) The Principal of the Law College (Secretary-Ex-officio).

Provided that, in the event of the office of Dean of the Faculty of Law being held by the Chief Justice or the Advocate-General or the Principal, or the Judge nominated under Clause (iii), the Vice-Chancellor may nominate an additional member to the Board.

13. It shall be competent to the Law College Advisory Board to make any recommendation to the University relating to the affairs of the College, either of its own motion or on a reference made to it.

14. There shall be an ordinary annual meeting of the Board in the month of March, every year. The President of the Board may, whenever he deems fit, and shall, on a written requisition by not less than three members, convene a special meeting of the Board.

15. In the absence of the President, the members present shall elect one of themselves to preside at the meeting. The President or the presiding member shall have one vote on all questions placed before the meeting; and in the event of the votes being equally divided, he shall have a second or casting vote.

16. The minutes of the meetings of the Board shall be recorded by the Secretary and a copy of the minutes shall be forwarded by him to the Registrar of the University as early as possible after each meeting.

17. Such rights or privileges in the matter of promotion or other advantage to which the present members of the staff and of the establishment of the Law College may be entitled on account of their being included in the Judicial Department shall not be prejudicially affected by the transfer of the College to the University.

## CHAPTER XVI.

### ELECTIONS.

#### A. General:

1. Except as otherwise provided in the Statutes or Ordinances, the Vice-Chancellor shall be responsible for the conduct of all elections held by the University and shall have power :—

- (a) to fix the dates of elections ;
- (b) to determine the form of notice, nomination, letter of intimation, declaration paper, ballot paper and cover and envelopes for any election ; and

(c) to declare the results of each election.

He may direct the Registrar to do all things necessary for the conduct of elections.

2. (a) Unless specifically provided otherwise, the decision of the Vice-Chancellor on any question relating to elections to University Bodies shall be final.

(b) If any question arises as to whether any person has been duly elected or nominated as, or is entitled to be, a member of any authority or body of the University, the matter shall be referred to the Vice Chancellor whose decision shall be final.

3. The Vice-Chancellor shall have power to hold or cause to be held elections in anticipation of vacancies that are about to occur owing to efflux of time.

4. No election shall be invalid by reason of any vacancy among the persons entitled to vote at such election, or on account of the loss, during transmission, of any notice or voting paper.

5. In the case of elections by registered graduates, only persons whose names are on the Register of Graduates at the time of the notification of the vacancy or vacancies, shall be entitled to vote or to be elected at such elections.

6. The results of all elections shall be published in the Travancore Government Gazette. Elections shall take effect, in the case of anticipatory elections, from the date of occurrence of the vacancy, and in other cases, from the date of notification of the result of the election.

7. Objections to elections shall be made in writing and shall be forwarded to the Registrar so as to reach him within seven days after the declaration of the result of the election.

8. The ballot papers, together with the declaration papers, of each election shall be preserved in the University Office or in the office of the officer conducting the election, as the case may be, for a period of one month after the date of the election, or, if any dispute arises regarding the election, until it is disposed of.

9. (a) The Registrar shall be the Returning Officer for all elections except—

(i) the election of members of the Senate by the members of the Sri Mulam Assembly and the Sri Chitra State Council; and

(ii) the election of the representatives of the Private First Grade Colleges to the Senate under Section 14 (a) (xi) of the Act.

(b) In the case of election to the Senate by members of the Sri Mulam Assembly and the Sri Chitra State Council, the Registrar shall request the Secretary of the Sri Mulam Assembly or the Sri Chitra State Council, as the case may be, to arrange for such election.

(c) The Principals of the respective colleges shall be appointed by the Vice-Chancellor as the Returning Officers for the election of members of the Senate by the staff of the Private First Grade Colleges under Section 14 (a) (xi) of the Act.

10. (a) The election of members of the Senate by the members of the Sri Mulam Assembly and the Sri Chitra State Council shall be conducted in accordance with the rules framed in this behalf by the President of the Sri Mulam Assembly or the Sri Chitra State Council, as the case may be.

(b) The election of members of the Senate by the members of the staff of the colleges referred to in Section 9 (c) above shall be conducted by the Principals of the respective colleges who shall for this purpose exercise the powers and perform the duties assigned to the Registrar in Statutes 12 to 21 of this Chapter so far as they are applicable.

#### B. Conduct of Elections.

11. (a) If any vacancy occurs or is about to occur by efflux of time among the members of any University Authority, which has to be filled up by an election conducted by the University, the Registrar shall, under the direction of the Vice-Chancellor, notify the electors of the fact, and also cause a notification to be published simultaneously in the Government Gazette.

(b) Along with such notification, the Registrar shall also publish the programme of the election giving the following particulars

- (i) Last date for receipt of nominations;
- (ii) Date of scrutiny of nominations;
- (iii) Last date and hour for withdrawal of candidature;
- (iv) Date of issue of Ballot Paper in case the number of candidates exceeds the number of vacancies ;
- (v) Date and hour fixed for the poll; and
- (vi) Date and hour of scrutiny and counting of votes.

12. Every elector shall be at liberty to nominate a qualified person to fill the vacancy. Every nomination shall be made by an elector in writing and shall be seconded in writing by another elector. Every such nomination shall be accompanied by the consent in writing of the nominee agreeing to serve on the University Authority, if elected, and must reach the Registrar not later than ten days after the publication of the notification in the Gazette.

13. All nomination papers shall be scrutinised by the Registrar or other Officer authorised by him in this behalf. Candidates and a representative of each candidate appointed in writing by him may be present at the scrutiny. After scrutiny a list of candidates validly nominated shall be published by the Registrar.

14. Any candidate may withdraw his candidature by notice in writing delivered to the Registrar or other Officer authorised by him, before 4 P. M. on the day following the date of scrutiny.

15. After the lapse of the time fixed for the withdrawal of nominations, the Registrar, or other Officer authorised by him, shall prepare and publish a final list of candidates validly nominated. And if the number of such candidates does not exceed the number of vacancies to be filled, all such candidates shall be declared to be duly elected.

If the number of such candidates exceeds the number of vacancies to be filled the Registrar shall proceed with the election in the manner prescribed in the following Statutes.

16. The Registrar shall forward to each elector a Declaration Paper, a Ballot Paper containing the names of the candidates, and a letter of intimation stating the number of vacancies, the date and hour fixed for the poll, and the date and hour fixed for the scrutiny and counting of votes. The date fixed for the poll shall be not less than ten days after the date of posting of the Ballot Paper.

17. When an elector has not received, or lost or inadvertently spoilt the ballot paper and other connected papers sent to him, he may make a declaration to that effect to the Registrar and return the spoilt papers if any, and the Registrar shall issue fresh papers to the elector.

18. An elector may vote for as many candidates as there are vacancies to be filled; but he cannot give more than one vote to a candidate. If more than one vote is recorded against the name of a candidate, it shall be considered as one vote only.

19. No person shall be present at the scrutiny and counting of votes except the Vice-Chancellor, the Registrar, and such persons as the Vice-Chancellor may appoint to assist the Registrar, the candidates and not more than one representative of each candidate appointed by him in writing.

20. (a) A ballot paper cover shall be rejected :—

- (i) if it is not accompanied by the declaration paper sent by the Registrar; or
- (ii) if the declaration is not in accordance with the rules; or
- (iii) if the ballot paper is placed outside the cover; or
- (iv) if more than one declaration paper or ballot paper have been enclosed in the same envelope.

(b) A ballot paper shall be invalid :—

- (i) if it does not bear the Returning Officer's initials; or
- (ii) if the voter signs his name or writes any word, or makes any mark on it by which it becomes recognisable; or
- (iii) if no vote is recorded thereon; or

(iv) if the number of votes recorded thereon exceeds the number of vacancies to be filled ; or

(v) if it is void for uncertainty :

Provided that where more than one vote can be given on the same ballot paper, if one of the marks is so placed as to render it doubtful to which candidate it is intended to apply, the vote concerned but not the whole ballot paper shall be invalid on that account.

21. Except in the case of elections on the principle of Proportional Representation, the nominee or nominees receiving the highest number of vote shall be declared to be duly elected. When two or more nominees receive an equal number of votes, and they cannot all be declared elected, the final election shall be made by drawing lots.

*(c) Election with Proportional Representation.*

22. The procedure prescribed below shall be followed in the case of Elections on the principle of Proportional Representation.

23. Each voter shall have only one vote ; but the vote will be transferable. Each elector shall indicate the order of his preference by placing the figures 1, 2 3, etc., against candidates who represent respectively, his first, second, third etc., choice.

24. A ballot paper shall be invalid :—

(a) if it does not bear the Registrar's initials ; or

(b) if the voter signs his name or writes any word or makes any mark by which it becomes recognisable ; or

(c) if the figure 1 is not marked ; or

(d) if the figure 1 is set opposite the names of more than one candidate ; or

(e) if the figure 1 and some other figure are set opposite the name of the same candidate ; or

(f) if it is void for uncertainty.

25. After the invalid ballot papers, if any, have been rejected, the remaining papers shall be divided into parcels according to the first preferences recorded for each candidate and the number of papers in each parcel noted.

26. The number of papers in all the parcels shall then be added together and the total divided by a number exceeding by one the number of vacancies to be filled, and the result increased by one shall be the number sufficient to secure the return of a candidate (hereinafter called the quota.)

27. Any candidate in whose parcel the number of votes on the first preferences being counted is equal to or greater than the quota, shall be deemed elected,

28. (i) If the number of papers in any such parcel is equal to the quota, the papers shall be set aside as finally dealt with.
- (ii) If the number of papers in any such parcel is greater than the quota, the surplus shall be transferred to the candidates indicated on the ballot papers as next in the order of the voters preference in accordance with the rules framed by the Syndicate for the transfer and counting of votes.
29. If after all the surpluses have been transferred less than the number of candidates required has been elected, the candidate lowest on the poll shall be excluded from the poll and his ballot papers distributed among the continuing candidates according to the next preferences recorded thereon.
30. (i) When as a result of the transfer of votes and the exclusion of candidates the number of continuing candidates is reduced to the number of vacancies remaining unfilled, the continuing candidates shall be deemed elected.
- (ii) When only one vacancy remains unfilled and the number of the votes of some one continuing candidate exceeds the total of all the votes of the other continuing candidates, that candidate shall be deemed elected.
31. If at any time a number of candidates equal to the number of persons to be elected has obtained the quota, such candidates shall be treated as elected, and no further steps shall be taken.

## CHAPTER XVII.

### Finance and Accounts.

1. The University shall have a fund styled "The Travancore University Fund" to which shall be credited :—

- (i) Its income from fees, interest on deposits, etc.
- (ii) Contribution from Government and other sources.
- (iii) Endowments, donations, etc.
- (iv) All miscellaneous receipts of the University.

2. The Syndicate shall make such arrangements as it deems necessary for the proper maintenance of the University accounts and for the audit and payment of bills presented at the University Office.

3. The accounts of receipts and expenditure of each year ending with the last day of Karkatakam shall, as soon as possible after they are audited, be published in the Government Gazette and copies thereof shall be placed before the Senate and submitted to Government.

4. A Board of Finance and Accounts shall be constituted by the Syndicate with the Vice-Chancellor as Chairman and the Registrar as Secretary and five other members at least two of whom shall be members of the Senate, who are not members of the Syndicate. Four members shall constitute a quorum. Members of the Board shall hold office until the next reconstitution of the Syndicate.

5. The Board have and exercise the following functions :—

- (a) to examine the annual budget estimates and advise the Syndicate thereon ;
- (b) to conduct a general examination of the accounts of the University and review the audit objections, and replies thereto ;
- (c) to make recommendations to the Syndicate on all matters relating to the finances of the University ;
- (d) to examine every proposal for new expenditure involving a sum exceeding Rs 3,000 and advise the Syndicate thereon ;
- (e) to review the financial position periodically ;
- (f) generally to devise means for the improvement of the financial position of the University.

6. The Syndicate shall cause to be prepared and laid before the Senate at its Annual Meeting each year estimate of the income and expenditure of the University for the year commencing on the 1st Chingom following.

7. The Financial Estimate shall be placed before and scrutinised by the Board of Finance and Accounts before they are submitted to the Senate.

8. The Financial Estimate shall be considered by the Senate at its annual meeting and the Senate may pass resolutions with reference thereto and communicate them to the Syndicate which may take such action as it may deem necessary on those resolutions.

9. The Budget Estimate after consideration by the Senate and revision, if any, by the Syndicate in accordance with the resolutions of the Senate, shall be submitted to the Government. It shall be competent to Government to sanction the Budget Estimates with such modifications, if any, as they may deem fit.

10. Unspent balances of budget allotments at the close of the financial year shall lapse to the University Fund.

11. (a) The Registrar shall be authorised to receive payments made to the University and to issue receipts therefor.

(b) The Registrar shall be competent :--

- (i) to draw the Establishment, Travelling Allowance, and Contingent Bills relating to the University Office ;
- (ii) to countersign Detailed Contingent bills ;
- (iii) to countersign all Travelling Allowance bills of employees of the University and of members of the Senate, Syndicate, Faculties and other Authorities and Bodies of the University ; and
- (iv) to countersign grants-in-aid, stipend and scholarship bill relating to private Colleges and Hostels.

12. The Travelling Allowance bills of the Vice-Chancellor and Pro-Vice-Chancellor shall require no countersignature.

13. It shall be competent to the Syndicate :--

- (i) to accord sanction for all works provided for in the budget (original and repairs) and to accept tenders therefor ;
- (ii) to dispose of all unserviceable articles ;
- (iii) to dispose of unserviceable buildings when the book value does not exceed Rs. 5,000 ;
- (iv) to write off unserviceable articles, apparatus, books, etc., whose book value does not exceed Rs. 1,000 ;
- (v) to sanction write off of irrecoverable revenue up to Rs. 500 in each case ;
- (vi) to sanction all re-appropriation of funds from one head to another head, provided that savings under salaries and establishment are not utilised for allowances, contingencies, etc., without the approval of Government ;
- (vii) to create for a period not exceeding one year temporary appointments, the pay or maximum pay of which does not exceed Rs. 300 per mensem, provided there is Budget provision ;
- (viii) to lay down the administrative, financial, and disciplinary powers of the Heads of the Colleges and other institutions maintained by the University ;
- (ix) to fix the amount of security to be taken from subordinates dealing with cash, stores and other valuables ;
- (x) to fix the permanent advance of offices and heads of institutions under the University ;
- (xi) to frame the rules relating to the preservation and destruction of records in all offices and institutions under the control of the University ;



- (xii) to sanction advances to the employees of the University up to Rs. 1,000 at a time ;
- (xiii) to frame rules regarding the purchase of stores, books, and other articles, and their stock-taking.

**14. It shall be competent to the Vice-Chancellor : --**

- (i) to sanction re-appropriation of funds up to Rs. 500 from one head to another, provided that savings under salaries and establishment are not utilised for allowances and contingencies ;
- (ii) to sanction transfer of funds from one minor head to another within the major head ;
- (iii) to accord sanction for works (original and repairs) up to Rs. 2,000 and to accept tenders for works up to Rs. 5,000 ;
- (iv) to sanction the journey on duty of all employees of the University whether inside or outside the State ;
- (v) to sanction excursion charges of the students of Colleges for practical instruction subject to budget provision ;
- (vi) to sanction all contingent expenditure subject to budget provision ;
- (vii) to permit the employees of the University to accept all forms of work offered by any University or other institution and the remuneration therefor ;
- (viii) to sanction extraordinary item of expenditure not provided for in the budget to the extent of Rs. 500, provided funds can be had by diversion ;
- (ix) to grant fee concession to students ;
- (x) to dispose of unserviceable articles including buildings when the book value does not exceed Rs. 500 in each case ;
- (xi) to write off unserviceable articles including damaged and worn-out appliances, apparatus, and books, when the book value does not exceed Rs. 250 in each case ;
- (xii) to sanction the sale by auction of all standing and fallen trees on the grounds under the control of the University and to order the removal of standing trees ;
- (xiii) to create temporary appointments, the pay or maximum pay of which does not exceed Rs. 150 per mensem, provided there is budget provision, or if the expenditure can be met out of savings ;
- (xiv) to make all appointments on the sanctioned staff, the pay or maximum pay of which does not exceed Rs. 150 per mensem ;

- (xv) to dismiss, discharge, degrade, suspend, withhold increments or reduce the pay of, fine, retire under the rules or accept the resignation of any officer whom he is competent to appoint ;
- (xvi) to grant any kind of leave to all members of the teaching staff and other employees of the University ;
- (xvii) to permit all employees of the University to return to duty before the expiry of any kind of leave granted to them ;
- (xviii) to transfer from one institution to another any employee of the University and to transfer any post from any institution maintained by the University to any other ;
- (xix) to condone breaks in the continuity of fee concessions and scholarships ;
- (xx) to sanction advances to employees of the University up to Rs. 500 at a time ;
- (xxi) to sanction investigation of all old claims ;
- (xxii) to sanction exemptions from the operation of Article 43 of the Travancore Service Regulations regarding age-limit.

15. Notwithstanding anything contained in the foregoing Statutes the arrangements now in force for the maintenance of the accounts relating to the University and the institutions transferred to its control shall continue to be in force till the end of the year 1113 M. E.

## CHAPTER XVIII.

### Academic Costume.

1. Academic Costume shall be worn by all members of the Senate and Teachers and Graduates of the University at Convocations and on such other occasions as the Vice-Chancellor may determine.

2. The Academic Costume shall consist of a gown, a hood or scar and a head-dress as prescribed hereunder :

- (i) *Chancellor* : Deep red tery velvet gown, made like an Oxford Proctor's gown, with four inch gold lace down the fronts and round the outside edges of the sleeves. Black velvet academic cap, bound round with gold lace, with tassel ten inches long, or *State Turban*.
- (ii) *Pro-Chancellor* : Gown like the Chancellor's, but with two-inch gold lace. Cap the same, when worn, but with gold tassel seven and a half inches long.
- (iii) *Vice-Chancellor* : Gown like the Chancellor's but of deep red silk with four-inch silver lace. Black velvet academic cap, bound round with silver lace, with silver tassel ten inches long or *levee turban*.

- (iv) *Pro-Vice-Chancellor* : Gown like the Chancellor's but of deep red silk with two-inch silver lace. Same cap, with silver lace, with silver tassel seven and a half inches long.
- (v) *Registrar* : Black damask silk gown, with black silk lace and silk tufts. Black cloth academic cap, with black silk tassel seven and a half inches long.
- (vi) *Members of the Senate* : A gown of black alpacca or silk repp similar in pattern to the Oxford M. A. gown, with a scarf of turkey-red silk or stuff, four inches wide, down the fronts, and a fringe of the same colour, three inches deep. A black velvet academic cap with a silk tassel seven and a half inches long, a white turban with gold lace half an inch wide, or a fez.
- (vii) *Bachelors* : A gown of black alpacca, silk or cotton repp, the same pattern as the Cambridge B. A. gown, except that the sleeves shall be looped up with a cord and button on the outside. A hood of turkey red silk, edged on the inside with silk, two inches deep, of the colour prescribed for the Faculty. A trencher cap of black stuff with tassel seven and a half inches long or a white turban or a fez.
- (viii) *Masters* : A gown of black alpacca or silk repp, similar in pattern to the Cambridge M. A. gown. A hood of turkey red silk, lined on the inside with silk of the colour prescribed for the Faculty. A trencher cap of black stuff with tassel seven and a half inches long, or a white turban with gold lace half an inch wide, or a fez.
- (ix) *Doctors of Philosophy* : A gown of black alpacca or silk repp, similar in pattern to the Master's gown, but with sleeves of scarlet silk repp. A hood of scarlet silk, edged on the inside and the outside, four inches deep, with silk of the colour prescribed for the Faculty. A trencher cap of black velvet with a tassel seven and a half inches long, or a white turban with gold lace half an inch wide, or a fez.
- (x) *Doctors of Science, Letters and Laws* : A gown of scarlet silk repp, or stuff, laced with silk of the colour prescribed for the Faculty, four inches wide. A hood of scarlet silk repp or stuff lined on the inside and edged on the outside, two inches deep, with silk of the colour prescribed for the Faculty. A black velvet cap as for Doctors in Oxford, or a white turban with gold lace half an inch wide, or a fez.

3. The Academic Costume for degrees awarded *Honoris Causa* shall be as prescribed for the same degree.

4. Graduates of other Universities may wear the Academic Costume which they are entitled to by virtue of their degrees.

5. *The State Turban* may be worn by persons entitled to wear it.

6. The wearing of a head dress is optional for ladies.

7. The following are the colours distinctive of Faculties :—

Arts	...	Cambridge blue
Law	...	Light pea-green
Science	...	Gold
Education	...	Navy blue
Technology	...	Dark green
Oriental Studies and Fine Arts		Pearl grey

8. Oriental Title Holders shall wear a long coat reaching four inches below the knee, buttoned to the neck, made of pearl grey cloth or silk, with white turban.

## CHAPTER XIX.

### MISCELLANEOUS.

1. The Boards of Studies appointed by the Syndicate shall also be authorities of the University, under Section 13 (a) of the Act.

2. Any communication required to be sent to any person under the laws of the University shall be despatched to the address of that person as registered in the University Office.

3. The posting of communications to the address furnished to the University Office shall be deemed a sufficient compliance with requirements of the law as to notice or despatch of papers.

4. If the day on which, or the last day of the period within which any act or proceeding is directed or allowed to be done or taken under the laws of the University, falls on a holiday for the University Office the act or proceeding shall be considered as done or taken in due time if it is done or taken on the next working day following.

## ORDINANCES.

(Passed under Section 31 (b) of Act I of 1113).

## CHAPTER I.

## Departments of Study.

1. The Faculty of Arts in the University shall include the following Departments of Study :—

- (i) English.
- (ii) Philosophy.
- (iii) History and Economics.

2. The Faculty of Science in the University shall include the following Departments of Study :—

- (i) Mathematics
- (ii) Physics.
- (iii) Chemistry
- (iv) Botany.
- (v) Zoology.
- (vi) Marine Biology and Fisheries.
- (vii) Research in Applied Sciences.
- (viii) Forestry.

3. The Faculty of Oriental Studies and Fine Arts in the University shall include the following Departments of Study :—

- (i) Malayalam.
- (ii) Sanskrit.
- (iii) Tamil.
- (iv) Fine Arts.
- (v) Research in Oriental Studies.

4. The Faculty of Technology in the University shall include the following Departments of Study.

- (i) Textile Technology
- (ii) Engineering.

5. The Faculty of Education in the University shall include the following Department of Study :—

- (i) Education.

6. The Faculty of Law in the University shall include the following Department of Study :—

- (i) Law.

## CHAPTER II.

## Boards of Studies.

1. A Board of Studies may be appointed for each Department of Study in the University.

2. (a) A Board shall consist of not less than four members and not more than ten members.

(b) Members of the Boards of Studies shall be appointed by the Syndicate.

(c) No person shall be appointed as a Member of a Board unless he is a teacher of, or has special knowledge in the subject or one of the subjects with which the Board is concerned.

(d) The Head of a Department of Study in the University shall be the Chairman, ex-officio, of the Board of Studies in the subject.

(e) In the event of a vacancy in the office of the Chairman or when the Chairman is temporarily unable to carry on his functions, the Vice-Chancellor may appoint a member of the Board to act as Chairman during such period.

3. Boards of Studies shall be reconstituted by the Syndicate once in three years. Any casual vacancies that may arise may be filled up by the Syndicate and a member appointed to fill such a vacancy shall hold office for the remaining portion of the said term of three years.

4. It shall be the duty of each Board of Studies to consider and report on any matter referred to it by the Syndicate or the Senate or the Faculty concerned with the subject with which it deals.

5. Each Board shall have power :—

(i) to recommend for the guidance of teachers and students books in which the prescribed subjects are suitably treated, and to recommend text-books when such are required ;

(ii) to recommend persons suitable for appointment as Examiners in the subjects with which it deals ;

(iii) to recommend persons suitable for appointment as Members of the Faculty or Faculties with which the Board is concerned ;

(iv) to make recommendations in regard to courses of study and examinations in the subjects with which it deals ;

(v) to consult specialists who are not members of the Board.

6. (a) Board of studies shall ordinarily meet once a year ; but the Vice-Chancellor may direct additional meetings to be held when necessary.

(b) Meeting of Boards of Studies shall be convened by the Registrar.

(c) A joint meeting of two or more Boards may be held, when the Syndicate or the Vice-Chancellor so directs, for the disposal of any question affecting those Boards.

(d) The Chairman of a Board shall preside at meetings of the Board. In the absence of the Chairman the members present shall elect a Chairman for the meeting.

(e) When a joint meeting of two or more Boards is held, the members present shall elect a Chairman for the meeting.

7. The quorum for a meeting of any Board shall be half the strength of the Board. The quorum for a joint meeting of two or more Boards shall be one-half of the total number of members in those Boards no one member, however, being counted more than once.

8. The Chairman of a Board of Studies shall keep a record of the proceedings of each meeting and shall forward a copy of the same to the Registrar as soon as possible after the meeting.

### CHAPTER III.

#### ADMISSION TO EXAMINATIONS AND EXEMPTION FROM THE PRODUCTION OF CERTIFICATES OF ATTENDANCE.

1. Subject to the provisions contained in section 2 of Chapter IV of the Ordinances, only persons whose names are contained in the Register of Matriculates shall be admitted to any Examination of the University.

2. Before being admitted to an examination a candidate must have been registered therefor. A candidate shall be registered afresh on each occasion on which he wishes to present himself for an examination and a candidate shall be registered only after he has submitted an application in the prescribed form and paid the fee prescribed.

3. He shall also, unless exempted by the syndicate, produce in the prescribed form a certificate of attendance.

4. No attendance for instruction in any institution other than an institution maintained by or admitted to the privileges of the University shall qualify for admission to any examination of the University.

5. No candidate shall be permitted to sit for an examination unless his annual (term) certificates of attendance, conduct, and progress or the order of exemption granted to him has been received by the Registrar before the commencement of the Examination.

6. The Syndicate may ordinarily grant exemption ---

(a) to a student studying in a College or in a Department of the University who has failed to keep three-fourths of the attendance prescribed by the College or the University Department of which he is a student, and is unable to produce his annual certificate of attendance, conduct, and progress provided that ---

(i) the shortage of attendance does not exceed five days ; and

(ii) the Syndicate considers that the reasons given for failure to keep the prescribed attendance are satisfactory ;

(b) to a student studying in a College in which the language in respect of which exemption is sought is not taught, provided the Syndicate is satisfied :

(i) as to the reasons assigned by the student for not studying in a College where the language in question is taught ;

(ii) as to the arrangements made for instruction being received by the student in that language in the following examinations :—

<i>Name of examination.</i>	<i>Part or Group for which exemption may be granted.</i>
Intermediate	Part II—Second Language.
B. A. and B. Sc.	Part II—Second Language.

(c) to a candidate who has passed the Intermediate Examination in Arts and Science to enable him to appear again for the same examination offering a different set of optional subjects under Part III of the Intermediate course, provided he has undergone the course of study prescribed in the set of subjects selected and has attended a college for a further period of not less than one year. (He shall be exempted from re-examination in English and the Second Language.)

(d) to a *bona fide* teacher to appear for the Intermediate Examination, the B. A., B. Sc., M. A. or M. Sc. (Mathematics only) Degree Examination without the production of attendance certificate under the following conditions :—

(i) Only *bona fide* whole-time teachers employed in recognised schools or colleges in Travancore who have passed the necessary previous examination qualifying for admission to the course of study leading to the examination and who have been in service as whole time teachers for a total period of not less than six years on the date of application shall be entitled to apply for exemption.

(ii) Applications for exemption should be made by the teachers in the prescribed form through the Director of Public Instruction, Travancore.

(iii) The interval between the date of passing the qualifying examination and that of the examination for which admission is sought should not be less than the normal period prescribed for the course of study for the latter.

(iv) Candidates for the Intermediate Examination and the B. Sc. Degree Examination who select subjects requiring practical training in a laboratory must produce a certificate of having done the prescribed laboratory work for at least three terms from the Professors in the subjects concerned in a first grade College in Travancore countersigned by the Principal of the College.



*Note :—*The certificate in respect of candidates for the Intermediate Examination may be from the Senior lecturers in the subjects concerned in a second grade College in Travancore, countersigned by the Principal of the College.

(v) Each application for exemption should be accompanied by the following documents :—

- (a) Certificates (in original) of the examinations passed.
- (b) A treasury receipt for Bh. Rs. (5) five being the fee required for considering the application.
- (c) A treasury receipt for Bh. Rs. (2) two being the fee required for registering the applicant as a Matriculate of the Travancore University, if the applicant has not already matriculated.
- (d) A certificate of verification of the service as teacher rendered by the applicant from the Division Inspector of Schools or the Inspectress of Girls' Schools or the Principal of the College, as the case may be.

(vi) *Bona fide* teachers who have passed the qualifying examination of a University other than the Travancore University should produce, in addition to the documents mentioned in (v) *supra*, the following documents :—

- (a) A Migration Certificate.
- (b) An application for recognition of the examination passed.
- (c) A treasury receipt for Bh. Rs. (5) five being the fee required for considering the application for recognition.

7. Every application for exemption shall be accompanied by a receipt showing that the prescribed fee has been paid.

8. Applications for exemption from students not studying in a College shall be forwarded so as to reach the Registrar before the 1st day of September preceding the examination to which admission is sought.

9. Orders of exemption granted under the preceding Ordinances shall be permanent.

## CHAPTER IV.

### REGISTER OF MATRICULATES.

1. The Syndicate shall maintain a Register of Matriculates in which the names of the following classes of persons shall be registered :—

- (a) Holders of completed English School Leaving Certificates issued by the Director of Public Instruction, Travancore, and who have been declared eligible for admission to a course of study in this University.

(b) Candidates who have passed any other examination conducted by any University or other authority recognised by the Syndicate as equivalent to the Travancore E. S. L. C. Examination when admitted to a University course of study.

(c) Holders of any degree, title, diploma or certificate other than those specified in (a) or (b) on first admission to a University course of study.

(d) Persons other than those specified in (a), (b) or (c) who with or without exemption from attendance certificates are permitted to appear for the first time for any examination of this University.

(e) Persons other than those specified in (a), (b), (c) or (d) who are candidates for admission to a Research Degree of this University.

2. All persons who enter upon a course of study or research in the University or appear for an examination of the University for the first time shall be required to have their names registered in the Register of Matriculates maintained by the Syndicate :

Provided, however, that registration as matriculates shall not be necessary in the case of candidates admitted to courses of study for which a minimum qualification of at least an English School Leaving Certificate with eligibility for admission to a University course of study has not been prescribed.

3. The Register of Matriculates shall set forth in respect of each Matriculate :-

- (i) The name in full.
- (ii) The name of father or guardian.
- (iii) Age
- (iv) Religion.
- (v) Mother-tongue.
- (vi) a. School where educated.
- b. Number and date of School Leaving Certificate.
- c. Authority issuing such Certificate.
- (vii) a. Accepted examination.
- b. Date of passing.
- c. Number of certificate.
- d. Authority issuing certificate.
- (viii) Institution entered, date of admission.
- (ix) University examination for which he has been permitted to appear ;

Or

- (x) Research Degree for which he is a candidate.

4. Every applicant for registration shall pay to the University such fee as may be prescribed.

## CHAPTER V.

## VACATION AND HOLIDAYS.

1. The academic year for all colleges and other educational institutions under the University shall consist of three terms which shall ordinarily begin and end as follows :

- First term : June to September, closing with the Onam Holidays.  
 Second term : October to December, closing with the Christmas Holidays.  
 Third term : January to April, closing with the mid-summer Vacation.

2. There shall be not less than 150 working days in the year.

*Exception 1.* Institutions like the College of Engineering and the Institute of Textile Technology which work on Saturdays also will have a minimum of 155 working days in an academic year.

*Exception 2.* In the Colleges of Arts and Science the minimum number of working days may be reduced by five days for the Senior classes which close earlier than the Junior classes.

*Note :* The number of working days, may, however, be reduced by the number of special holidays, if any, with the specific sanction of the Syndicate in each case.

3. The academic year for all Colleges and other educational institutions maintained by the University shall begin on the first Monday after the 5th June. There shall be a vacation commencing from Saturday preceding the University Examinations and ending with Sunday preceding the first Monday after the 5th June. A period not exceeding 15 days shall be allowed for the Onam and Christmas Holidays preceding the Second and Third terms respectively. The dates of commencement of these holidays each year will be notified by the Registrar.

4. All Colleges and other educational institutions shall be closed on the following days :

- Sundays and other gazetted holidays ;
- Birthday of H. H. the Maharaja ;
- Birthday of H. M. The King Emperor ;
- Such other holidays as may be notified by the Registrar.

5. In colleges admitted to the privileges of the University, the management may fix the working days and holidays subject to the provisions contained in rules 1 and 2 above.

6. At the commencement of each academic year the Principals of Colleges and other educational institutions shall forward to the Registrar a calendar showing the list of the working days and holidays during the year. They shall also report from time to time any change in the list made by them subsequently.

## CHAPTER VI.

## CONDUCT OF EXAMINATIONS.

1. All examinations shall be held at Trivandrum and at such other places as may be sanctioned by the Syndicate.

The Intermediate Examination shall be held twice in the academic year; in March and September.

2. The papers set in any subject shall be such as a candidate of decided ability, well prepared in the subject, can reasonably be expected to answer within the time allotted.

3. No question shall be put at any University examination calling for a declaration of religious belief, or profession or political views on the part of the candidates, and no answer given by any candidate shall be objected to on the ground of its giving expression to any particular form of religious belief, profession or political views.

4. The Syndicate may appoint separate Boards for setting question papers and for conducting examinations, as it deems fit. Joint or separate Boards may be appointed to conduct different examinations.

5. The Syndicate shall appoint a Chairman for each Board, who shall at the conclusion of every examination forward to the Syndicate a report on the manner in which the examination has been conducted.

6. The Boards of Examiners shall report to the Syndicate the results of all examinations conducted or supervised by them.

7. The Syndicate shall have power to approve and publish the results.

The results shall be published in the Government Gazette in such manner as the Syndicate may from time to time direct.

8. A diploma under the seal of the University shall be presented at a Convocation to each successful candidate at an examination for a degree, title or diploma. The diploma shall set forth the date of the examination, the subject in which the candidate was examined, the class in which he was placed, and the subjects, if any, in which he gained distinction.

## CHAPTER VII.

## BOARDS OF EXAMINERS.

1. The Syndicate shall, after considering the recommendations of the Faculties and Boards of Studies, appoint a Board of Examiners for each subject or group of subjects in which examinations are likely to be held.

2. (a) Each Board shall include one or more External Examiners, *i. e.*, persons not connected with teaching work in any College or other institution under the University.

(b) Each Board shall have a Chairman who shall be appointed by the Syndicate.

3. The duties of the Examiners will be---

- (i) to set question papers ;
- (ii) to distribute the work of valuation of papers ;
- (iii) to set the standard of valuation and to supervise the work of Additional or Assistant Examiners ;
- (iv) to value answer papers ;
- (v) to conduct Practical or Oral Examinations ;
- (vi) to report on the results of the Examinations ; and
- (vii) such other work as may be assigned to them by the Syndicate.

4. No person engaged in teaching work in any College under the University shall ordinarily be appointed to set a paper in the subject which he is teaching in the year of the Examination.

5. Where the Syndicate considers it necessary it may appoint Examiners whose duty will be only to set question papers.

6. In addition to Members of Boards of Examiners the Syndicate may also appoint Additional or Assistant Examiners for the valuation of answer papers or for the conduct of Practical Examinations.

7. (a) No person shall ordinarily be appointed as a Member of a Board of Examiners unless he has had at least seven years' teaching experience.

(b) No person shall be eligible for appointment as an Additional or Assistant Examiner unless he has had at least five years' teaching experience.

8. If any Examiner resigns his appointment, or is for any cause incapable of acting as an Examiner, the Vice-Chancellor may appoint another Examiner to fill the vacancy.

9. (a) Members of Boards of Examiners, Additional Examiners and Assistant Examiners shall be appointed for one year in the first instance, and may be eligible for re-appointment in two successive years following the year of appointment.

(b) Examiners shall not ordinarily be appointed for more than three consecutive years or for more than three years in any period of five years. Where the Syndicate considers it necessary in the interest of the efficient conduct of an examination it may appoint a person as an Examiner for five consecutive years.

10. The provisions of Ordinance No. 7 above shall not apply to the appointment of Examiners for Professional Examinations, Oriental Titles Examinations and Diploma Examinations held by the University.

11. The remunerations and allowances payable to Examiners shall be fixed by the Syndicate.

12. Detailed instructions shall be issued by the Syndicate for the guidance of Examiners, and all Examiners shall carry out such instructions.

## CHAPTER VIII.

### Fees.

1. Candidates for examinations, diplomas and degrees shall pay the following fees—

#### (a) Examination Fees.

	Bh. Rs.
Intermediate Examination	
Whole Examination	25
Part I	10
Part II	8
Part III	18
B. A. and B. Sc. Degree Examinations :	
<i>First appearance.</i>	
Whole Examination or any part or parts	48
<i>Subsequent appearance.</i>	
Whole Examination	48
Part I	20
Part II	10
Part III	24
B. A. (Honours) and B. Sc. (Honours) Degree Examinations :	
Preliminary	15
Final	60
M. A. and M. Sc. Degree Examinations	60
L. T. Degree Examination	20
B. L. Degree Examination :	
F. L. Examination	40
B. L. Degree Examination	50
Sanskrit Entrance Examination	5
Mahopadhyaya Preliminary Examination	12
Do. Final	12
Sahityavisarada Examination	12
Vidvan	12
Diploma Examination in Engineering Part I	25
Do. Do. Part II	30
First Examination in Engineering Part I	25
Do. Do. Part II	25

	Bh. Rs.
B. Sc. (Eng.) Degree Examination Part I ...	40
Do. Do. Part II ...	40
First Examination in Textile Technology or Textile Chemistry ...	20
Diploma Examination in Textile Technology or Textile Chemistry ...	25
Diploma Examination in Forestry ..	50
(b) <i>Degree or Diploma fee.</i>	
Diploma fee (for taking Degree at a Convocation in person) ...	3
Degree <i>in absentia</i> fee (including Diploma fee) ..	10
M. A. Degree fee ...	25
(c) <i>Fees for the submission of theses for Research Degrees.</i>	
M. Sc. Degree ...	100
Ph. D. ...	150
D. Sc. ...	200
D. Litt. ...	200

provided that no fees shall be levied in the case of Honorary Degrees.

2. Research Students and Fellows (stipendiary and non-stipendiary) permitted to study in the Departments of the University or under any Teacher of the University shall pay the following fees :—

Persons working in Arts Departments—either Bh. Rs. 30 per annum or Bh. Rs. 10 per term (thrice in a year).

Persons working in Science Departments—either Bh. Rs. 45 per annum or Bh. Rs. 15 per term (thrice in a year).

3. Colleges applying for the opening of additional courses or subjects of study shall pay the following fees :—

At the rate of Bh. Rs. 100 for each member of the Inspection Commission appointed.

4. Graduates applying for registration in the List of Registered Graduates shall pay a fee of Bh. Rs. 5.

5. Other Fees :—

	Bh. Rs.
I. (i) For Registration as a Matriculate ....	2
II. (i) For considering application for exemption from the production of attendance certificate ...	5
(ii) For considering application for recognition of an examination of another University or examination conducted by other Bodies outside the jurisdiction of the University ...	5

	Bh. Rs.
(iii) For considering application for recognition of change of name ...	10
(iv) For obtaining a duplicate Diploma or Certificate ...	5
(v) For obtaining a Provisional Certificate ...	2
(vi) For application for Intermediate Certificates received by the Registrar after the prescribed date ...	3
(vii) For obtaining a Migration Certificate ...	2
(viii) For obtaining a duplicate copy of the Migration Certificate ...	2
(ix) For issue of a certified extract from the Register or Records of the University ...	1
(x) For supplying marks to a candidate obtained at any examination other than the B. A. and B. Sc. Degree Examination ...	2
(xi) For supplying marks to a candidate obtained at the B. A. and B. Sc. Degree Examination for each Part ...	2
(xii) For supplying marks to a candidate obtained at the Intermediate Examinations ...	2
(xiii) For supplying detailed marks to a candidate obtained at Examinations for the details of each subject comprising a minimum (additional fee) ...	1
(xiv) For checking the addition of the marks in each paper of a candidate for any University Examination (for each paper) ...	5
(xv) For late receipt of applications, for admission to Examinations, received within a period of 5 days after the prescribed dates ...	1
(xvi) For supplying to Principals marks of all the successful candidates at the Intermediate Examination (for each examination of the year) ...	20
(xvii) For supplying to Principals marks of all candidates (passed and failed) from a particular College for the B. A., B. Sc., B. A. (Hons.), B. Sc. (Hons.), F. L., B. L., L. T. or any other examination	Annas 8 per candidate subject to a maximum of Rs. 10 for an examination for every 50 candidates or less



- (xviii) For supplying to Principals of Colleges detailed marks in each subject comprising a minimum (for each candidate)

## CHAPTER IX.

### Transfer and Term or Annual Certificates.

1. No student who has previously studied in any recognised school or College shall be admitted to a college unless he presents a transfer certificate showing :—

- (a) the name of the student in full.
- (b) the date of birth as entered in the admission register.
- (c) the dates on which he was admitted to and on which he left the institution.
- (d) the class in which he studied at the time of leaving it.
- (e) if it be the time when annual promotions take place, whether he is qualified for promotion to a higher class.
- (f) that he has paid all fees or other moneys due to that institution in respect of the academic year in which he was enrolled, and a certificate of Medical Inspection, if any, from the institution in which he last studied.

No student shall be enrolled pending the production of such certificate. Every such certificate shall be endorsed with the admission number under which the student is enrolled and shall be filed for reference and inspection.

2. A student applying for a transfer certificate during an academic year in which he was enrolled, or applying not later than the fifth working day of the academic year immediately following shall forthwith be given such certificate upon payment of all fees or other moneys due or of such portion thereof as the Principal may see fit to demand, for the academic year in which he was enrolled.

A student applying for such certificate after the fifth working day of the academic year immediately following that during which he was last enrolled shall forthwith be given it on payment of (1) all fees or other moneys due or of such portion thereof as the Principal may see fit to demand in respect of the academic year in which he was last enrolled, and (2) an additional fee of Rs. 3 at the option of the Principal :

Provided that, when a student has been enrolled at favourable fee rates, he shall be liable for such rates only.

No student shall be considered to have been enrolled in any academic year unless he has attended the college and received instruction for at least one day of that year or has paid the fees or portions thereof prescribed.

In the case of a student who has been a candidate for a University Examination, the results of which have not been published before the

beginning of the academic year the eleventh day after the results of that examination have been announced at the University Office shall be counted for him the first working day of the academic year so far as the grant of a transfer certificate is concerned.

In the event of a Principal refusing or delaying to give a transfer certificate to which the student may be entitled, the student shall have right of appeal to the Syndicate.

3. If any student is expelled from any college maintained by or admitted to the privileges of the University, intimation of the fact of expulsion, with a statement of the reasons therefor shall be given forthwith, by the Principal (a) to the parent or guardian of the student (b) to the Syndicate ; intimation to the Syndicate shall be accompanied by the transfer certificate of the student. The Syndicate, on the application of the student or his parent or guardian may after making such enquiry as it deems proper deliver the certificate to the student with any necessary endorsement or withhold it temporarily or permanently.

4. A student shall ordinarily qualify for the annual certificate in one and the same college, but in special cases the Syndicate may allow attendance in different colleges to be combined for the purposes of the annual certificate.

5. A student in the Arts or Science Course desirous of transfer from one college to another shall apply to the Syndicate for permission to combine attendances at the two colleges for purposes of the annual certificate. Such applications shall be submitted in every case prior to making the desired transfer and shall furnish valid reasons for the change proposed. This rule applies to a transfer during a term as well as to a transfer at the end of an academic year when an additional term is proposed to be kept in a different college. An application for transfer shall invariably be accompanied by (i) the written consent of the Principal of the college in which the student is studying and (ii) the written promise of admission from the Principal of the college which he proposes to join, together with an assurance countersigned by the latter Principal that the student if permitted by the Syndicate to combine attendances, will in the main, be able to continue in his college the course of study already commenced by the student under each part of the examination.

In the case of a student in Arts or Science Course who has been permitted to combine attendances in two colleges the annual certificates will be accepted as satisfying the Ordinances provided the student has kept either.

(a) three quarters of the possible attendances in each college before and after his transfer respectively or,

(b) three quarters of the combined total of possible attendances in the two colleges taken together.

6. In all colleges the grant of the annual certificate shall be in respect of three consecutive terms comprising one year ; but the Syndicate may permit the authorities of a college to grant such certificate in respect of three terms which are not consecutive provided that the student has during those terms completed the necessary course of study.

7. The grant of the annual certificate shall be subject in addition, to the following conditions :—

(1) The certificate shall not be granted unless a student has kept three fourths of the attendances prescribed by the college in the course of instruction followed by him during the year.

(2) The certificate shall not be granted unless the student has completed the course of instruction to the satisfaction of the authorities of his college and his progress and conduct have been satisfactory.

8. Every candidate for admission to the Intermediate Examination shall be required to undergo a course of Physical Training prescribed by the college and approved by the University and his annual attendance and progress certificate shall not be considered complete unless the Principal of the College has certified to the effect that the candidate has undergone the prescribed course in physical training and put in three fourths of the attendance.

The course of Physical Training to be prescribed by a College and Certified to by the Principal may include as alternative.

(1) Membership of the University Labour Corps.

(2) Field sports or games and

(3) Formal Physical Exercises provided that such activities are pursued for not less than two periods a week of at least 45 minutes' duration each.

The Syndicate may grant exemption from the course of Physical Training to (a) such students as may have been declared by the Medical Officer who conducted the Medical Inspection of the students to be unfit to undergo a course of physical training and (b) women students who may be attending Colleges for men.

9. In the Intermediate or the Pass B. A./B. Sc. Degree Course a student who has failed to earn the progress certificate at the end of the first year's course shall be required to rejoin the first year class for another full year.

A student who has not been selected for the March-April University Examination but who at the close of the academic year is certified

by the Principal to have made such satisfactory progress as to be fit for admission to the examination, may appear for a subsequent examination without further attendance at a college provided that he has earned the necessary attendance certificate.

A student who has failed to earn the progress certificate for the second academic year must attend college to receive such additional instruction as the Principal may, in his discretion prescribe so as to enable him to earn the required progress certificate.

10. The Ordinances governing attendance and progress shall apply *mutatis mutandis* to the students of the Institute of Textile Technology.

## CHAPTER X.

### BOARD OF PHYSICAL EDUCATION.

1. There shall be a Board of Physical Education.
2. The Board shall consist of a President and a Secretary and not more than five members to be nominated by the Syndicate.
3. They shall hold office for a term of three years; but shall be eligible for re-nomination at the end of their term.
4. The Director of Physical Education in the University shall be the Secretary of the Board (ex-officio).
5. The powers and duties of the Board shall be—
  - (a) To determine the general policy of the Department of Physical Education with the approval of the Syndicate and to guide and control its activities;
  - (b) To frame rules, with the approval of the Syndicate, relating to the residence, health and physical education of students;
  - (c) To organise the University Athletic Association and the University Games Clubs, and to exercise administrative control over them;
  - (d) To frame and administer the annual budget of the Department with the approval of the Syndicate;
  - (e) To make recommendation in regard to physical education activities of the colleges and institutions maintained by or admitted to the privileges of the University so as to secure effective co-ordination and satisfactory progress.

## CHAPTER XI.

## RESIDENCE OF STUDENTS.

1. Every student not residing with his parents or guardians shall be required to reside in any of the hostels maintained by the University or in hostels or lodgings recognised by the University. The Syndicate shall maintain a register of approved hostels and lodgings.

2. The Warden, Manager or Proprietor of an institution who desires to have it placed on the list of approved hostels and lodgings shall apply to the Registrar furnishing the following particulars.

- (i) the locality of the hostel and its surroundings ;
- (ii) the accommodation provided ;
- (iii) arrangements made for water supply, lighting, sanitation, medical help, boarding, games etc.

He shall also forward a copy of the rules for the management of the institution and a sketch plan of the buildings and grounds. The Syndicate after any further enquiry which it may deem necessary shall decide whether or not, any institution can be placed on the approved list. Any approved hostel or lodging shall be open to inspection at any time by any person deputed by the University or the Board of Physical Education. Changes in the rules for the management of an institution shall be made only with the approval of the Syndicate.

3. The Syndicate shall arrange for the periodical inspection of all hostels by persons selected for the purpose. A recognised hostel shall be required to maintain and produce for inspection when called for by an authorised person, an admission register, a register of attendance and a conduct register.

4. The management of every hostel shall submit to the Registrar at the end of each year a report on the working of the hostel for the year.

5. The Syndicate may suspend or withdraw the recognition granted to a hostel or lodging which is not conducted according to the conditions of recognition, provided that before any action is taken, the management concerned shall be given an opportunity of making such representation in the matter as it may desire to make.

6. Students expelled from colleges shall not be admitted to any recognised hostel or lodging. Students who have been rusticated shall not be permitted to reside in recognised hostels or approved lodgings during the period of rustication.

7. The following classes of lodgings may be recognised : —

- (1) Collegiate Hostels.
- (2) Non-Collegiate Hostels.
- (3) Private Lodgings.

(1) *Collegiate Hostel.* A Collegiate Hostel is a boarding house which is under the direct control of a College and which generally admits only students reading in that College.

The management of a Collegiate Hostel shall be in the hands of the governing body of the College to which it belongs. There shall be in every such Hostel, a Resident Warden, Superintendent, or Proctor and if necessary one or more Assistant Superintendents.

The Principal of the College concerned shall frame rules for his Collegiate Hostel.

(2) *Non Collegiate Hostels.* A non-Collegiate Hostel, is a boarding house for students run by private agencies. Only the following classes of boarders may be admitted to such Hostels :—

(i) Students of a College maintained by or admitted to the privileges of the University.

(ii) Students of recognised schools.

There shall be in every such Hostel a Resident Warden, Superintendent or Proctor and if necessary one or more Assistant Superintendents. Every non-Collegiate Hostel shall have printed or written rules.

(3) *Lodgings.* Students may be permitted to live in approved private lodgings provided that the Syndicate is satisfied that they can be permitted to do so without detriment to their health, studies or character.

8. Every student shall inform the Principal of his College his place of residence; change of residence, if any, shall also be reported.

9. A student whose residence is found unsatisfactory shall be called upon to shift to an approved hostel or lodging.

## CHAPTER XII.

### Medical Inspection of students.

1. Every student admitted to a college shall present along with other certificates, a certificate of medical inspection from the school or college he attended last.

2. Every student shall be required to undergo a medical inspection, on admission to a college and every alternate year thereafter.

3. The medical inspection shall be conducted by qualified medical officers: only those who have been admitted to a Degree in Medicine of a British or Indian University and have practised medicine for a period of not less than 5 years shall be eligible for appointment as medical officers in Colleges. The medical inspection of women students shall be conducted only by lady Doctors. The Syndicate shall appoint and also determine the terms of appointment of the medical

officers for the Colleges maintained by the University. The medical officers for the Colleges admitted to the privileges of the University shall be appointed by the College concerned and approved by the Syndicate.

4. Every student on the roll of a college shall present himself for medical inspection before the medical officer concerned on such date as may be fixed by the medical officer in consultation with the Principal of the college. If a student fails to present himself for medical inspection at the appointed time his case shall be reported by the medical officer through the Principal of his College to the Syndicate which may punish him in such manner as it thinks fit.

5. After each medical inspection the medical officer shall (a) record the results of the medical inspection of students in the prescribed form; (b) give such medical advice to each student as he may consider necessary (c) invite the special attention of the Principal to all cases of a serious character.

6. A report on the results of the medical inspection shall be forwarded by the medical officer through the Principal of the College to the Registrar.

## CHAPTER XIII.

### The Travancore University Labour Corps.

1. Students and members of the teaching staff of the University are eligible for enrolment in the Travancore University Labour Corps in accordance with the rules framed for the administration of the Corps.

2. Members will remain in the Corps so long as they continue to be students or teachers of the University or until discharge. On leaving the Corps they are under no further obligation.

3. Uniform, equipment and arms are provided free of charge, each member being responsible for the return in good condition (except for normal wear and tear) of the articles issued to him.

4. Membership of the Corps involves attendance at parades and the annual camp. (Attendance in camp is compulsory).

5. Notwithstanding anything contained in the Ordinances relating to the examinations of the University, no student who is a member of the Corps shall be admitted to an examination of the University unless he has attended at least 75 per cent. of the parades and the annual camp held in each of the academic years during which he prosecuted his course for the examination.

Provided that the Syndicate may on the recommendation of the Commandant of the Corps, for special reasons to be recorded, condone any deficiency in such attendance.

6. If the percentage of class attendance for any student is deficient on account of attendance at parades or in camp, credit will be given for the number of hours or days spent by the student on parade or in camp respectively.

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## CHAPTER XIV.

### PATENTS.

1. It shall be competent to the Syndicate to take out patents in respect of any discovery or invention made by the teachers of, or research students working in the University.

2. The patent shall be taken in the joint names of the University and the person responsible for the discovery or invention.

3. The expenses in connection with the registration of patents shall be borne by the University.

4. Any profits accruing from the patent shall be shared equally between the University and the person responsible for the invention or discovery.

5. The person responsible for the invention or discovery shall render free service in connection with the exploitation of the patent. The terms on which patents may be offered for exploitation shall be determined solely by the Syndicate.

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## CHAPTER XV.

### Superannuation of teachers in Colleges admitted to the privileges of the University.

1. Members of the teaching staffs of the Colleges admitted to the privileges of the University shall ordinarily retire at the end of the academic year in which they complete 55 years of age.

2. In special cases, however, extension of service may be granted for one year at a time with the approval of the Syndicate ; such extension of service shall in no case be granted for more than three years.

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## CHAPTER XVI.

## Intermediate Examination in Arts and Science.

1. The Intermediate Examination in Arts and Science shall be open to candidates who—

(a) are holders of the English School Leaving Certificate issued by the Director of Public Instruction, Travancore, and have been declared eligible for admission to a course of study in this University, or have passed any other examination conducted by any University or other authority recognised by the Syndicate as equivalent thereto; and

(b) have registered themselves as matriculates of this University and unless exempted therefrom by the Syndicate, undergone a course of study in the prescribed subjects for a period of not less than two academic years in a College maintained by or admitted to the privileges of this University.

2. The course shall consist of three parts.

Part I—English.

Part II—A Second Language.

Part III—Optional subjects.

The scope of each part shall be as indicated below.

*Part I - English.*

The course shall consist of :—

- (i) the detailed study of certain prescribed books which shall include one play of Shakespeare, two prose books and about 800 lines of poetry.
- (ii) instruction and exercise in English Composition with a view to developing the student's power of understanding English and using it as a vehicle of clear, correct and concise expression.
- (iii) the perusal, as distinct from a detailed study, of other prescribed books. Not more than 2 books shall be prescribed.

*Note*—The books prescribed from year to year shall be of the same average length and difficulty. Among the prose texts prescribed for detailed study, the major part will be recent and present day English prose. Of the two books prescribed for perusal one shall be a novel by some standard author, and the other a work on modern thought or achievement.

*Part II-- Second Language.*

One of the following languages may be offered :--

Sanskrit,  
Arabic,  
Syriac,  
French,  
Hindi,  
Malayalam,  
Tamil and  
Urdu.

Text books shall be prescribed from time to time in each of these languages. Besides the study of prescribed text-books, the course shall include also a study of the grammar of the language and training in translation in the case of Modern Indian Languages. There shall be also instruction and training in original composition.

*Part III---Optional Subjects.*

Three subjects shall be selected out of the following at the option of the candidates.

Mathematics,  
Physics,  
Chemistry,  
Biology,  
Geography,  
Logic,  
Indian History,  
Ancient History,  
Modern History,  
Music.

The scope of each subject shall be indicated by a detailed syllabus or by the prescription of text books

## 3. SCHEME OF EXAMINATION.

The examination shall consist of three parts.

*Part I--English.*

There shall be 3 papers each of three hours duration and carrying a maximum of 100 marks each.

Paper i. Shakespeare and Poetry--Prescribed books.

Paper ii. Modern Prose--Prescribed books.

Paper iii. English Composition The paper in English Composition shall contain exercises designed to test the candidate's power of using the English Language as a medium of expression. In particular it shall contain :--

- (a) Exercises in epitomising and paraphrasing passages in prose and poetry selected, from books other than those prescribed for study ;
- (b) Subjects for two essays based on the contents of the books prescribed for general reading and on topics of general interest.

All papers in English shall be regarded as a test primarily of the candidates command of correct English, and in valuation greater emphasis shall be placed upon this aspect of the work than upon knowledge of the substance of the texts.

### *Part II. Second Language.*

There shall be two papers of three hours duration each. Each paper shall carry a maximum of 100 marks. The first paper shall contain questions on the text-books prescribed for detailed study and on Grammar. The second paper, in the case of Modern Indian Languages, shall contain questions on Original Composition and on subjects from the non-detailed texts and translation from English into the selected language and *vice versa*. In the case of Sanskrit and other classical languages, and modern European languages the second paper shall contain only questions on translation from English into the selected language and *vice versa*.

*Note.*— The subjects for original Composition and the passages for translation from English into the selected language shall be common to all the Modern Indian Languages.

### *Part III—Optional Subjects.*

There shall be two papers in each of the subjects offered under Part III. Each paper shall be of two-and a half hours' duration and shall carry 75 marks.

In the case of Indian Music there shall be both a theory paper and a practical Examination, each carrying 75 marks ; the theory paper shall be of three hours' duration.

4. A candidate shall be declared to have passed the intermediate Examination if he appears for all the three parts at the same examination and obtains not less than :

- (a) 35 per cent. of the marks in Part I, English ;
- (b) 35 per cent. of the marks in Part II, Second Language ; and
- (c) 35 per cent. in each of the three subjects selected under Part III.

There shall be a Moderation Board appointed by the Syndicate to consider hard cases.

5. Candidates who obtain not less than 50 per cent. of the total number of marks shall be placed in the first class. All other successful

candidates shall be placed in the second class. Successful candidates who obtain not less than 60 per cent. of the marks in any subject shall be declared to have gained distinction in that subject.

6. A candidate who has passed the Intermediate Examination may be permitted to appear again for the examination in a new subject or subjects under Part III provided he has undergone the course of study prescribed in the new subject or subjects selected and has attended a College of the University for a further period of not less than one year.

## CHAPTER XVII.

### DEGREE OF BACHELOR OF ARTS.

1. Candidates for the Bachelor of Arts (B. A.) Degree Examination shall, unless exempted by the Syndicate, be required to have passed the Intermediate Examination of this University or an Examination accepted by the Syndicate as equivalent thereto and to have subsequently undergone the prescribed course of study for a period of not less than two academic years.

2. The course shall consist of three parts:

Part I	...	English.
Part II	...	Second Language.
Part III	...	Optional subjects.

The course of each Part shall be indicated by a syllabus and/or text-books to be prescribed from time to time.

#### *Part I—English.*

The course shall comprise :—

- (a) The study in detail of certain prescribed books. The works prescribed for detailed study shall consist of the following :—
  - (i) Shakespeare—2 plays,
  - (ii) Modern Poetry from Milton to the present day (about 1000 lines).
  - (iii) Modern Prose :—Not more than three books shall be prescribed, of which one at least shall be from recent or living authors.
- (b) Composition on matter supplied by books prescribed for perusal and one question on a subject of general interest or a precis of some unseen passage. The works prescribed for perusal as a basis for Composition shall be not more than three, which may be novels, essays or works of general interest.

*Note :-*—The text-books prescribed from year to year shall be of the same average length and difficulty. Certain of the prescribed books which are to be studied in detail shall be retained from year to year. The books prescribed for perusal under (b) shall be changed every year.

*Part II—Second Language.*

The course shall comprise the study of any one of the following Classical or Modern (European or Indian) Languages, at the option of the candidate, according to a syllabus or text-books or both to be prescribed from time to time :

(a) Classical	{	Sanskrit.	
		Arabic.	
		Syriac.	
(b) Modern.	{	(1) European	{ French.
			{ German.
	{	(2) Indian	{ Malayalam.
			{ Tamil.
			Hindi.
			Urdu.

*Part III Optional subjects.*

One of the following groups :

*Group (i-a)—Philosophy.*

The course shall comprise the study of the following subjects :

- (1) Psychology.
- (2) Ethics.
- (3) European Logic or Political Philosophy.
- (4) Indian Logic or an Indian Philosophical Classic (to be prescribed from time to time)
- (5) A European Philosophical Classic (to be prescribed from time to time).

*Group (i-b)—Philosophy.*

The course shall comprise the study of the following subjects :—

- (1) Ethics.
- (2) Psychology.
- (3) Political Philosophy.
- (4) Economics.
- (5) Indian History or European History or Constitutional History of Great Britain and Ireland.

The syllabuses and papers for (1), (2) and (3) will be the same as for group (i-a) Philosophy, and the Syllabuses and papers for (4) and (5) will be the same as for group (ii-a) History and Economics.

**Group (ii-a)—History and Economics.**

The course shall comprise the study of the following subjects:—

- i. General Indian History.
- ii. Constitutional History of Great Britain and Ireland.
- iii. Outlines of European History.
- iv. Economics—General, and
- v. Politics.

**Group (ii-b)—Economics and History.**

The course shall comprise the study of the following subjects:—

- i. Economics—General (in common with Group (ii-a).
- ii. Social Economics.
- iii. Modern Economic History of England and India (from 1600 A. D.)
- iv. (a) and  
iv. (b) { Any two of the following subjects.  
Politics,  
Outlines of European History, } in common with  
General Indian History. } **Group (ii-a).**

The scope of each subject shall be indicated by a syllabus or text-books or both, to be prescribed from time to time.

The paper "Social Economics" shall consist of two parts: (a) Rural Economics and (b) Industrial Economics, both with special reference to India.

**Group (iii)—Languages other than English.**

Candidates shall select any one of the following languages, which shall be taken in conjunction with the cognate subject or related language specified below:—

(iii-a) Sanskrit, with Early Indian History.

(iii-b) Malayalam or Tamil with Sanskrit or Early South Indian History.

The scope of each subject shall be prescribed by a syllabus or by text books or both.

**SCHEME OF EXAMINATION.**

1-3. The scheme of Examination shall be as follows:—

**Part I—English.**

There shall be four papers each of three hours duration and carrying a maximum of 100 marks each:—

- (i) Shakespeare (Prescribed books for detailed study).
- (ii) Poetry Do.
- (iii) Prose Do.

- (iv) Composition. This paper shall contain subjects for two essays on matter applied by the books prescribed for perusal and one question on a subject of general interest or a precis of some unseen passage.

NOTE—All papers in English—Part—I—shall be regarded as a test of a candidate's command of correct English and in valuation greater emphasis shall be placed upon this aspect of the work than upon knowledge of the substance of the text.

### *Part II -Second Language.*

There shall be two papers each of three hours' duration and carrying a maximum of 100 marks each.

In the case of Modern Indian Languages, Paper (i) shall contain questions on the prescribed text-books in Poetry and Prose Grammar and History of Language and Literature and Paper (ii) shall contain questions on the non-detailed text-books and on original Composition and Translation.

In the case of Sanskrit, Paper (i) shall contain questions on the prescribed text-books on Poetry and Prose and on Grammar and Paper (ii) shall contain questions on History of Language and Literature and Translation from Sanskrit into English and *vice versa*.

In the case of modern European languages paper (i) shall consist of passages for translation from the text-books, questions on idiom and grammar and questions on the subject matter of the text-books; paper (ii) shall consist of a subject of composition chosen from the prescribed text-books or having reference to modern thought, and unseen translation from the selected language into English and *vice versa*.

### *Part III—Optional Subjects.*

#### *Group (i a) Philosophy.*

The examination shall consist of five papers as follows :—

	Hours.	Marks.
1 Psychology	3	100
2 Ethics	3	100
3 European Logic or Political Philosophy	3	100
4 Indian Logic or an Indian Philosophical Classic	3	100
5 A European Philosophical Classic	3	100
Total	...	500

*Group (i-b) Philosophy.*

The examination shall consist of five papers as follows :—

	Hours.	Marks.
1 Psychology	3	100
2 Ethics	3	100
3 Political Philosophy	3	100
4 Economics	3	100
5 Indian History or European History or Constitutional History of Great Britain and Ireland	3	100
Total		500

*Group (ii-a) History and Economics.*

There shall be five papers of three hours' duration each.

	Marks.
1 Politics	100
2 General Indian History	100
3 Constitutional History of Great Britain and Ireland	100
4 Outlines of European History	100
5 Economics—General	100
Total	500

*Group (ii-b) Economics and History.*

There shall be five papers of three hours' duration each, as follows :—

	Marks.
1 Economics—General	100
2 Social Economics	100
3 Modern Economic History of England and Indian (from 1600 A. D.)	100
4 & 5 Two out of the following : General Indian History* Politics* Outlines of European History*	100 100 100
Total (of 5 papers)	500

\*The question Papers in these subjects shall be common to both Groups (ii a) and (ii b).

*Group (iii) Languages other than English.*

The examination shall consist of six papers of three hours' duration each.



*Group (iii-a)--Sanskrit and Early Indian History.*

	Marks.
1 Books of the Vedic Period	80
2 Books of the Classical Period I	80
3 Books of the Classical Period II	80
4 Grammar--Historical and Comparative	80
5 History of Sanskrit Literature	80
6 Cognate subject--Early Indian History	100
Total	500

*Group (iii-b) Malayalam or Tamil with Sanskrit or Early South Indian History.*

	Marks.
1 Set books and History of Literature I	80
2 Set books and History of Literature II	80
3 History of Language and Grammar	80
4 Comparative Grammar--Dravidian	80
5 Composition	80
6 Cognate subject : Early South Indian History	100
or	
Related Language--Sanskrit	100
Total (of 5 papers)	500

4. A candidate shall not be declared to have passed the B. A. Degree Examination unless he has passed the Examination in all the three parts. A candidate who obtains not less than 35 per cent. of the marks in Part I shall be declared to have passed the Examination in Part I ; a candidate who obtains not less than 35 per cent. of the marks in Part II shall be declared to have passed the Examination in Part II ; and a candidate who obtains not less than 35 per cent. of the total marks in the selected optional group in Part III and not less than 30 per cent. of the marks in each division of the Examination in this Part shall be declared to have passed the Examination in Part III.

5. The division of the Examination in the Groups under Part III shall be as follows :--

*Group (i-a) Philosophy.*

- (a) Psychology and Ethics.
- (b) European Logic or Political Philosophy, Indian Logic or Indian Philosophical Classic and European Philosophical Classic.

*Group (i-b) Philosophy.*

- (a) Psychology, Ethics.
- (b) Economics, History and Political Philosophy.

*Group (ii-a)—History and Economics.*

- (a) Indian, European and Constitutional Histories.
- (b) Economics and Politics.

*Group (ii-b)—Economics and History.*

- (a) Economics—three papers: Economics (General), Social Economics and Economic History.
- (b) The two optional subjects.

*Group (iii)—Languages other than English.*

- (a) Main Language.
- (b) Cognate subject. or

*Related Language.*

6. Successful candidates who obtain not less than 60 per cent. of the marks in any Part shall be placed in the first class in that Part. Successful candidates who obtain less than 60 per cent. and not less than 50 per cent. of the marks in any Part shall be placed in the second class in that Part. All other successful candidates obtaining less than 50 per cent. of the marks in any Part shall be placed in the third class in that Part.

7. A candidate for the B. A. Degree Examination may, at his option, present himself for the whole or for any Part or Parts of the Examination at any one time. He should, however, pay the fee for the whole Examination at his first appearance.

8. A person who has qualified for the B. A. Degree of this University shall be permitted to present an additional language as a Second Language under Part II of the B. A. Degree Examination, provided that the Syndicate is satisfied that he has undergone the course of study prescribed in the language selected by attending a College for a period of not less than one academic year after qualifying for the Degree.

9. A person who has qualified for the B. A. Degree of this University shall be permitted to appear for a different optional group under Part III of the B. A. Degree Examination, provided that the Syndicate is satisfied that he has undergone the course of study prescribed for the selected new Group of optional subjects by attending a College for a period of not less than one academic year after qualifying for the Degree.

## CHAPTER XVIII.

## DEGREE OF BACHELOR OF SCIENCE (B. Sc.)

1. Candidates for the Bachelor of Science Degree Examination shall be required to have passed the Intermediate Examination of this University or an examination recognised by the Syndicate as equivalent thereto and to have subsequently undergone the prescribed courses of study for a period of not less than two academic years.

2. The course shall consist of three Parts

Part I—English

Part II—Second Language.

Part III—Optional subjects.

The scope of each Part shall be indicated by a syllabus and/or text books prescribed from time to time.

The course of study for Parts I and II shall be the same as those prescribed for the B. A. Degree Examination.

## PART III—OPTIONAL SUBJECT.

One of the following groups of subjects to be taken at the option of the candidates :—

(i-a) Mathematics.

(i-b) Mathematics Main, Physics Subsidiary.

(ii-a) Physics           ,,   Mathematics           ,,

(ii-b) Physics           ,,   Chemistry           ,,

(iii-a) Chemistry       ,,   Physics           ,,

(iii-b) Chemistry       ,,   Botany           ,,

(iii-c) Chemistry       ,,   Zoology           ,,

(iv-a) Botany           ,,   Chemistry           ,,

(iv-b) Botany           ,,   Zoology           ,,

(v-a) Zoology           ,,   Chemistry           ,,

(v-b) Zoology           ,,   Botany           ,,

The course of the study shall be as follows : -

*Group (i-a)—Mathematics.*

The course shall comprise the study of (1) Algebra and Statistics, (2) Geometry (Pure and Analytical), (3) Trigonometry and Calculus (4) Dynamics, (5) Astronomy and (6) Mathematics (Additional Paper).

*Group (i-b)—Mathematics Main.*

The course shall comprise the study of (1) Algebra and Statistics, (2) Geometry (Pure and Analytical), (3) Trigonometry and Calculus and (4) Dynamics.

*Physics—Subsidiary.*

The course shall comprise the study of the following subjects :—

Properties of matter, Hydrostatics, Heat, Light, Magnetism and Electricity.

*Group (ii-a)—Physics—Main.*

The course shall comprise the study of the following subjects :—

Dynamics, Statics, Hydrostatics and Pneumatics, Properties of Matter, Heat, Light, Sound, Magnetism, Electrostatics and Electricity

*Mathematics—Subsidiary.*

The course shall be of a less advanced character than that for candidates taking Mathematics of the main standard.

*Group (ii-b) – Physics Main as for Group (ii-a)—  
Chemistry Subsidiary.*

The course shall be of a less advanced character than that for candidates taking Chemistry of the main standard.

*Groups (iii-a), (iii-b) and (iii-c).*

Chemistry Main, Physics, Botany and Zoology as subsidiary subjects.

*Groups (iv-a) and (iv-b).*

Botany Main, Chemistry and Zoology as subsidiary subjects.

*Group (v-a) and (v-b).*

Zoology Main, Chemistry and Botany as subsidiary subjects.

The course shall comprise the study of the subjects detailed in the Syllabuses (*Vide* Appendix II) and the knowledge required of the candidates for the examination in the subsidiary subject shall be less detailed than that required for a pass in the main subjects.

**3. SCHEME OF EXAMINATION.**

The schemes of examination shall be as follows :—

Part I	...	English.
Part II	..	Second Language.

Candidates for the Bachelor of Science Degree Examination shall be required to answer the same question papers in Part I and II as those set for the B. A. Degree Examination.

## PART III.—OPTIONAL SUBJECTS.

*Group (i-a) Mathematics.*

The examination shall consist of six papers as follows:—

	<i>Hours.</i>	<i>Marks.</i>
1. Algebra and Statistics ...	3	90
2. Geometry (Pure and Analytical) ...	3	100
3. Trigonometry and Calculus ...	3	100
4. Dynamics ...	2	60
5. Astronomy ..	3	80
6. Additional Paper in Mathematics ...	2½	70
<b>Total</b>		<b>500</b>

*Group (i-b)—Mathematics Main.*

The examination shall consist of four papers as follows:

	<i>Hours.</i>	<i>Marks.</i>
1. Algebra and Statistics . . .	3	90
2. Geometry (Pure and Analytical) ..	3	100
3. Trigonometry and Calculus ..	3	100
4. Dynamics . . .	2	60
<b>Total</b>		<b>350</b>

The question papers in subjects 1, 2, 3 and 4 shall be common to groups (i-a) and (i-b).

*Physics—Subsidiary.*

The examination shall consist of two papers of two hours' duration each and a practical examination of three hours' duration.

	<i>Hours.</i>	<i>Marks.</i>
1. Hydrostatics, Properties of Matter and Heat ...	2	50
2. Light, Electricity and Magnetism ..	2	50
Practical Examination ...	3	50
<b>Total</b>		<b>150</b>

*Group (ii-a)—Physics Main.*

The examination in theory shall consist of four papers of three hours' duration each. There shall be a practical examination also.

	<i>Hours.</i>	<i>Marks.</i>
1. Dynamics and Hydrostatics ...	3	60
2. Properties of Matter and Heat ...	3	60
3. Light and Sound ...	3	60
4. Electricity and Magnetism ...	3	60
Practical examination ...	6	90
Laboratory note books ...	...	20
<b>Total</b>		<b>350</b>

At the Practical Examination candidates must submit to the examiner their Laboratory Note books (duly certified by their Professors or Lecturers) as *bona fide* records of work done by the candidates.

*Mathematics—Subsidiary.*

The examination shall be of a less advanced character than that for candidates taking Mathematics of the main standard.

The examination shall consist of two papers as follows :—

	<i>Hours.</i>	<i>Marks.</i>
Mathematics I Paper	3	75
Mathematics II Paper	3	75
Total		150

*Group (ii-b) Physics—Main as for Group (ii-a)  
Chemistry Subsidiary.*

The examination shall be of a less advanced character than that for candidates taking Chemistry of the main standard. There shall be a written examination of two papers and a practical examination.

	<i>Hours.</i>	<i>Marks.</i>
General and Inorganic Chemistry	3	60
Organic Chemistry	2	40
Practical Examination	3	50
Total		150

The Practical Examination shall be held to test the candidate's ability to make experiments illustrating the subjects included in the course, identifying the more common metals and their compounds (containing not more than one acid and one base) and making simple volumetric analysis with standard solutions of acids, alkalis, potassium permanganate and of iodine and sodium thiosulphate.

*Groups (iii-a), (iii-b) and (iii-c).*

There shall be a written examination of three papers of three hours' duration each and a practical examination of two papers of six hours' and three hours' duration respectively.

	<i>Hours.</i>	<i>Marks.</i>
1. General Theoretical and Physical Chemistry	3	70
2. Inorganic Chemistry	3	70
3. Organic Chemistry	3	80
4. Practical examination		
(i) Inorganic Chemistry	6	80
(ii) Organic Chemistry	3	30
Laboratory Note books		20
Total		350

At the Practical examination candidates must submit to the Examiner their Laboratory Note books (duly certified by their Professors or Lecturers) as *bona fide* records of work done by the candidates,

*Physics—Subsidiary as for Group (i-b)*

*Botany—Subsidiary.*

	Hours.	Marks.
Written Examination :		
Paper I—Morphology, and Taxonomy of Angiosperms and Histology ...	2	50
Paper II—Thallophytes, Bryophytes Pterydophytes, Gymnosperms, Plant Physiology and General Principles ...	2	50
Practical Examination ...	3	50
<b>Total</b> ...		<b>150</b>

*Zoology—Subsidiary.*

	Hours.	Marks.
Written Examination Paper I Invertebrata ...	2	50
Written Examination Paper II Chordata ...	2	50
Practical Examination ...	3	50
<b>Total</b> ...		<b>150</b>

*Groups (iv-a) and (iv-b)—Botany—Main.*

The examination shall be both written and practical and the scheme of examination shall be as follows :—

	Hours.	Marks.
1. Written Examination :		
Paper I—Morphology and Taxonomy of the Angiosperms, Plant Physiology, Econo- mic Botany and General Principles ...	3	75
Paper II—Thallophytes, Bryophytes, Pteri- dophytes, Gymnosperms and Histology ..	3	75
2. Practical Examination :		
Paper I—Subject as for written exami- nation Paper I above ...	3	75
Paper II—Subjects as for written exami- nation Paper II above ...	3	75
Laboratory Note books ...		25
Herbarium collection ...		25
<b>Total</b> ...		<b>350</b>

*Chemistry Subsidiary as for group (ii-b).*

*Zoology Subsidiary as for group (iii-c)*

*Groups (v-a) and (v-b)—Zoology main.*

	Hours.	Marks.
Written Examination :		
Paper I—Invertebrata	3	100
Paper II—Chordata	3	100
Practical Examination ;		
Paper I	3	60
Paper II	3	60
Laboratory Note books		30
Total		350

At the Practical Examination candidates must submit to the Examiner their Laboratory Note books (duly certified by their Professors or Lecturers) as *bonafide* records of work done by the candidates

*Chemistry subsidiary as under group (ii-b).*

*Botany subsidiary as under group (ii-b).*

4. A candidate shall not be declared to have passed the B. Sc. Degree Examination unless he has passed the examination in all the three Parts. A candidate who obtains not less than 35 per cent. of the marks in Part I shall be declared to have passed the examination in Part I ; a candidate who obtains not less than 35 per cent. of the marks in Part II shall be declared to have passed the examination in Part II, and a candidate who obtains not less than 35 per cent. of the total marks in the selected optional group in Part III and not less than 30 per cent. of the marks in each division of the Examination in this Part shall be declared to have passed the examination in Part III.

5. The divisions of the examination in the groups under Part III shall be as follows :—

Group (i-a)	(a) Algebra and Statistics, Geometry (Pure and Analytical,) Trigonometry and calculus, Dynamics.
	(b) Astronomy and Additional paper in Mathematics.
Group (i-b)	(a) Main Subject.
	(b) Subsidiary Subject.
Other Groups.	(a) The written examination in the main subject.
	(b) The Practical examination in the main subject.
	(c) The examination in the subsidiary subject,



6. Successful candidates who obtain not less than 60 per cent. of the marks in any Part shall be placed in the first class in that Part. Successful candidates who obtain less than 60 per cent. and not less than 50 per cent. of the marks in any Part shall be placed in the second class in that Part. All other successful candidates obtaining less than 50 per cent. of the marks in any Part shall be placed in the third class in that Part.

7. A candidate for the B. Sc. Degree Examination may at his option present himself for the whole or for any Part or Parts of the examination at any one time. He should, however, pay the fee for the whole examination at his first appearance.

8. A person who has qualified for the B. Sc. Degree of the University shall be permitted to appear for a different optional group under Part III of the B. Sc. Degree Examination provided that the main subject offered for the subsequent examination shall be one different from the main subject in which he previously qualified for the degree and provided also that the Syndicate is satisfied that he has undergone the course of study prescribed for the selected new group of optional subjects by attending a College for a period of not less than one academic year after qualifying for the degree. He shall be exempted from examination in the subsidiary subjects provided it was offered as his main or subsidiary subject on the occasion when he qualified for the degree.

A candidate who obtains not less than 35 per cent. of the marks in the aggregate and not less than 30 per cent. in each division of the optional group shall be declared to have passed the examination, and a special certificate setting forth the further subjects of the examination passed by him and the date of such examination shall be given to him.

*Note :—*Candidates for the B. Sc. Degree Examination, who commenced their course of study prior to or during 1939-40 may be allowed to take groups (i-a) and (i-b) of the examination during the years 1942 and 1943 under the following courses of study, Scheme of Examination and Divisions of examination.

#### *Group (i-a) Mathematics.*

The course shall comprise the study of (1) Algebra and Trigonometry, (2) Calculus, (3) Geometry (Pure and Analytical). (4) Dynamics, (5) and (6) two special subjects to be chosen from (i) Statistics, (ii) Astronomy and (iii) Pure Geometry.

#### *Group (i-b) Mathematics—Main.*

The course shall comprise the study of (1) Algebra and Trigonometry, (2) Calculus, (3) Geometry (Pure and Analytical) (4) Dynamics

*Scheme of Examination.**Group (i-a) Mathematics.*

The examination shall consist of six papers.

	Hours.	Marks.
(1) Algebra and Trigonometry	3	90
(2) Geometry	3	90
(3) Dynamics	2	60
(4) Calculus	2	60
(5) Special subject I	3	100
(6) Do. II	3	100
Total	...	500

*Group (i-b) Mathematics—Main.*

The examination shall consist of four papers as follows :—

	Hours.	Marks.
(1) Geometry	3	90
(2) Algebra and Trigonometry	3	90
(3) Dynamics	2	60
(4) Calculus	2	60
Total	...	300

The course of study and scheme of examination in Physics Subsidiary (Group i-b) shall be the same as for the other candidates.

*Divisions of Examination.*

Group (i-a)	(a) Compulsory subjects.
	(b) Special Subjects.
Group (i-b)	(a) Main subject.
	(b) Subsidiary Subjects.

Common papers shall be set in Dynamics, Geometry, and Astronomy, alternative or compulsory questions being set with a view to test the candidates under the new scheme in the additional portions prescribed for them.

## CHAPTER XIX.

## DEGREE OF BACHELOR OF ARTS, (Honours.)

1. Candidates for the Bachelor of Arts (Honours) Degree Examination shall be required to have passed the Intermediate Examination of this University or an Examination accepted by the Syndicate as equivalent thereto and to have undergone subsequently a further course of study for a period of not less than three academic years.

2. The course shall consist of two parts :—

*Part I Preliminary Examination.*—English to be studied during the first year of the course.

The course shall include—

(a) In the case of candidates other than those who have selected English Language and Literature under Part II.

(i) the study, in detail, of certain prescribed books in English prose ; and

(ii) the study of certain books prescribed for perusal.

(b) In the case of candidates who have selected English Language and Literature

(i) the study of the History of England treated in relation to the History of English Language and Literature ; and

(ii) the study of certain books prescribed for perusal [as in (a) (ii) above.]

The Preliminary Examination shall be held at the end of the first year of the Honours Course.

*Part II. Final Examination.*—One of the following Branches to be selected.—

I. *Philosophy.*—(Details will be published later).

II. *History and Economics.*—The course shall comprise the study of (1) the History of India, (2) the Constitutional History of Great Britain and Ireland, (3) Politics, (4) Economics, (5) Essay, (6 & 7) Special (Optional) subjects—(any two subjects to be selected from a list prescribed from time to time under the following main heads :—Politics, History, Indian History, Economics.)

III. *English Language and Literature.*—The course shall comprise the study of—

1. (a) *Old and Middle English Literature up to 1400 A. D.* There shall be prescribed certain selected texts for detailed study.

(b) *The History of the English Language* shall include Phonology, Accidence and Syntax, also Germanic Philology so far as it bears on the English Language. The scope of the study is to be indicated by Wright's *Elementary Old English Grammar*, *Elementary Middle English Grammar*, and *Elementary Historical New English Grammar*, Wyld's *Short History of English* and C. T. Onions' *Advanced English Syntax*.

2. *The History of English Literature—Shakespeare ; Modern English ; Essay.* A candidate shall be required to show a knowledge of the whole course of the History of English Literature. In *Shakespeare*,

a candidate shall, in addition to the detailed study of the prescribed plays, be required to show a general knowledge of Shakespeare's works, of the Chronology of the plays, of the conditions of the Shakespearean stage and the character of the audience, as influencing Shakespeare's plays, of the textual problems in Shakespeare's works and of Shakespearean criticism.

In *Modern English* there shall be set books in prose and poetry including drama, from the fifteenth to the twentieth century. A candidate shall be required to make a detailed study of certain specified texts and to show a general knowledge of the other prescribed texts.

The *Essay* shall be on any subject connected with English Language and Literature.

3. *Special period or subject.*—A candidate shall be required to offer for examination a special period or subject selected from the following list :—

- (a) Elizabethan Literature (1558---1637)
- (b) The age of Milton and Dryden.
- (c) The Age of Pope and Johnson.
- (d) Wordsworth and his contemporaries.
- (e) Tennyson and his contemporaries.

A candidate shall be required to show a knowledge of the writings of the chief authors of the period selected. He shall also be examined on set books of the period prescribed for detailed and non-detailed study.

(f) Indo-Germanic Philology and with special reference to Gothic. A candidate offering (f) shall be examined in select extracts of the literary remains of Gothic.

A candidate shall give notice through his college, at least a year before the date of the examination, of the books or groups of books which he proposes to offer under 3.

#### IV. *Sanskrit Language and Literature.*

The course shall comprise the study of—

- (i) History of Sanskrit Language and Literature,
- (ii) Comparative Philology and Comparative Grammar,
- (iii) Grammar, Prosody, Poetics and Elements of Nyaya and Mimamsa.
- (iv) Prescribed Text Books —General.
- (v) Special subject or subjects (to be prescribed from time to time).

V. *Malayalam Language and Literature*:—The course shall comprise the study of :—

- (i) Prescribed text-books (General.)
- (ii) **Special Period or Subject.**  
Prose: Early, Middle and Modern Periods.
- (iii) Grammar, Prosody and Poetics,
- (iv) History of Language and Philology.
- (v) The History of the Literature and Literary Criticism.
- (vi) History of Kerala from original sources and Inscriptions.
- (vii) Sanskrit : Kavyas and Natakas and Elements of Sanskrit Grammar.

### 3. SCHEME OF EXAMINATION.

The Scheme of Examination shall be as follows :—

#### *Part I.—Preliminary Examination.*

English.

There shall be two papers for the Preliminary Examination, each of three hours' duration and carrying 100 marks each.

Paper I—English Prose or History of England.

Paper II—English Composition.

#### *Part II.—Final Examination.*

There shall be both a written and *viva voce* examination. No fixed proportion of marks shall be assigned to the *viva voce* examination. It is intended to assist the examiners in placing the candidates and shall be held after the examiners have valued the written answers.

*Branch II.—History and Economics.*—There shall be seven paper of three hours' duration each.

	Marks
(i) The History of India	200
(ii) Constitutional History of Great Britain and Ireland	200
(iii) Politics—General	200
(iv) Economics—General	200
(v) Special subject—I	200
(vi) Special subject—II	200
(vii) Essay	200
Total	1,400

*Branch III.—English Language and Literature.* The examination shall consist of three divisions.

## DIVISION A.

	Hours.	Marks.
(i) History of the English Language	3	150
(ii) Old and Middle English (up to 1400 A. D.)	3	150

## DIVISION B.

(iii) Shakespeare	3	200
(iv) Modern English Literature—I	3	150
(v) Modern English Literature—II	3	150
(vi) Modern English Literature—III	3	150
(vii) Essay	3	150

## DIVISION C.

(viii) Special Period or subject—Paper (i)	3	150
(ix) Special Period or subject—Paper (ii)	3	150
Total		1,400

*Branch IV—Sanskrit Language and Literature.*

	Hours.	Marks.
(i) Comparative Philology and Comparative Grammar	3	150
(ii) History of the Sanskrit Language and Literature	3	150
(iii) Translation and Essay	3	150
(iv) Prescribed Text books General—Early Texts	3	150
(v) do. Later Texts Prosody, Poetics	3	150
(vi) Grammar, Elements of Nyaya and Mimamsa	3	200
(vii) Prescribed Text-books Special I	3	150
(viii) do. II	3	150
(ix) do. III	3	150
		1400

*Branch V—Malayalam Language and Literature*—There shall be nine papers as follows ;—

	Hours.	Marks.
(i) Prescribed Text books	3	150
(ii) Special Period or subject	3	200
(iii) Grammar, Prosody and Poetics	3	150
(iv) History of Language and Philology	3	150

	<i>Hours.</i>	<i>Marks.</i>
(v) The History of the Literature and Literary Criticism ...	3	150
(vi) History of Kerala from original source and inscriptions ...	3	150
(vii) Sanskrit ...	3	200
(viii) Essay ...	3	150
(ix) Translation ...	3	100
Total ...		1,400

4. No candidate shall be permitted to undergo the complete Final Examination in Honours more than once. A candidate for the Final Examination shall be permitted to withdraw from the examination, provided he has not sat for the last paper in the examination, and provided he has given notice of withdrawal to the Registrar within three clear days from the date of the last paper which he answered. He shall be permitted to appear again for the Final Examination in the following year without producing any additional certificate of attendance.

5. A candidate for the B. A. (Honours) Degree shall be required to appear for the Final Examination in Honours not later than the end of the fourth year after commencing the Honours Degree course.

6. No candidate shall be admitted to the Final Examination in Honours unless he has passed the Preliminary Examination.

7. A candidate who secures not less than 40 per cent. of the aggregate marks in two papers in the Preliminary Examination shall be declared to have passed the examination. A candidate who secures not less than 60 per cent. of the aggregate marks shall be declared to have passed the examination with distinction.

8. A candidate shall be declared to have passed the B.A. (Honours) Degree Examination if he obtains not less than 40 per cent. of the total marks and not less than 30 per cent. in each division of the Final Examination.

The divisions shall be :—

*Branch II. History and Economics.*

- (a) Indian History, Constitutional History and Essay.
- (b) Politics and Economics.
- (c) Special subjects.

*Branch III. English Language and Literature.*

- (a) History of the Language and Early English Texts.
- (b) Shakespeare, Essay and Modern English Literature, periods I, II and III.
- (c) Special Period or Subject—Papers (i) and (ii).

*Branch IV. Sanskrit Language and Literature.*

(a) Comparative Philology and Comparative Grammar with special reference to Sanskrit ; History of Sanskrit Literature, Essay and Translation.

(b) Prescribed text books—General—Early texts—selected portions from Regveda, Bramanas and Upanisads ; Later texts, Prosody and Poetics ; Grammar and elements of Nyaya and Mimamsa.

(c) Prescribed text-books—Special.

*Branch V Malayalam Language and Literature.*

(a) Prescribed Text-books ; Special Period or Subject ; Grammar, Prosody and Poetics ; and History of Language and Philology.

(b) History of the Literature and the Literary Criticism ; Sanskrit and Essay.

(c) History of Kerala and Translation.

9. Successful candidates in the Examination shall be ranked in the order of proficiency as indicated by the total marks obtained by each candidate and shall be arranged in three classes. Candidates who obtain not less than 60 per cent. of the aggregate marks shall be placed in the first class. Those who obtain less than 60 per cent. but not less than 50 per cent. shall be placed in the second class, and all other successful candidates shall be placed in the third class.

10. In the event of a candidate for the B. A. (Honours) Degree Examination failing to satisfy the examiners he may be recommended by them for the B. A. Degree provided that he obtains not less than  $33 \frac{1}{3}$  per cent. of the total marks and not less than 25 per cent. in each division of the examination. A candidate who having failed completely in the B. A. (Honours) Degree Examination desires to appear for the B. A. Degree Examination shall be allowed to do so without production of a further certificate of attendance in a College.

A candidate who presents himself for the B. A. Honours Degree Examination in any year and withdraws from the same and is prevented from subsequently presenting himself for the Examination within the period prescribed under Ordinance 5 of this Chapter shall be allowed to appear for the B. A. Degree Examination without the production of a further certificate of attendance in a College.

11. Candidates appearing for the B. A. Degree Examination under this Ordinance shall appear for all the Parts of the examination and shall take under Part III the same optional subject which they studied for the Honours Course except in the case of candidates who took English Language and Literature for the B. A. Honours course who may be permitted to take any of the optional groups for the B. A. Degree Examination.



## CHAPTER XX.

## DEGREE OF BACHELOR OF SCIENCE (HONOURS).

1. Candidates for the Bachelor of Science (Honours) Degree Examination shall be required to have passed the Intermediate Examination of this University or an Examination accepted by the Syndicate as equivalent thereto and to have undergone subsequently a further course of study for a period of not less than three academic years.

2. The course shall consist of two parts:—

*Part I—Preliminary Examination.* English to be studied during the first year of the course.

*Part II—Final Examination.*

One of the following branches of knowledge to be studied:—

- I. Mathematics or
- II. One of the following subjects to be studied as a main subject and another of these or Mathematics to be studied as a subsidiary subject:—
  - (i) Physics
  - (ii) Chemistry
  - (iii) Botany
  - (iv) Zoology.

*Part I*—The course of study shall be the same as for *Part I* of the B. A. (Honours) Degree Course.

The Preliminary examination shall be held at the end of the first year of the Honours Course.

*Part II*

*Branch I—Mathematics.*

The course shall comprise the study of:—

(a) Pure Mathematics:—

- (i) Pure Geometry.
- (ii) Algebra and Theory of Equations.
- (iii) Plane Trigonometry.
- (iv) Differential and Integral Calculus (including Reimann Integration, Cauchy's Theorem on Contour Integration and Fourier's Series).
- (v) Elementary Differential Equations.
- (vi) Co-ordinate Geometry of Two and Three Dimensions.

(b) Applied Mathematics:—

- (i) Statics including the Elements of the Theory of Attractions.
- (ii) Dynamics of a Particle.

- (iii) Dynamics of a Rigid Body.
  - (iv) Hydrostatics
  - (v) Astronomy, General and Elementary Spherical.
- and (c) Two subjects to be selected out of the following list of optional subjects.

- (1) Dynamical Astronomy.
- (2) Theory of Heat conduction.
- (3) Theory of Attractions and Potentials.
- (4) Hydrodynamics (a) Irrotational motion or  
(b) Vortex motion.
- (5) Advanced Rigid Dynamics.
- (6) Functions of real variables.
- (7) Theory of Uniform Functions of a complex variable and Integral function.
- (8) Theory of Differential Equations—  
(a) Linear Differential Equations or  
(b) Partial Differential Equations.
- (9) Statistics including Theory of Errors of Observation and Probability.
- (10) Vector Analysis.
- (11) Differential Geometry.
- (12) Theory of Elasticity.

A candidate shall give notice through his College, a year before the date of the examination, of the particular subjects he proposes to take.

#### BRANCH II —PHYSICS (Main).

A candidate shall be required to possess a comprehensive knowledge of the experimental side of the following subjects and also such knowledge of the theoretical side of each as may be obtained by the applications of the Calculus and simple differential equations :—

- (1) Mechanics of solids and fluids
- (2) Properties of Matter
- (3) Heat
- (4) Geometrical and Physical Optics
- (5) Sound
- (6) Magnetism and Electricity
- (7) Modern Physics.

A candidate shall also be required to possess a special knowledge, experimental and theoretical, of one of the following subjects, the choice of the subject being left to the option of the candidate.

- (1) Meteorology
- (2) Electrical waves, wireless telegraphy and telephony.
- (3) Spectroscopy and its applications.
- (4) X-rays and their applications.

A candidate shall give notice through his College, one year before the date of the final examination, of the particular subject he proposes to take.

### BRANCH III—CHEMISTRY. (Main)

A candidate shall be required to show that he has made a more comprehensive study than for the B. Sc. Degree (Pass) of the four main divisions of the subject :—

- (1) General Theoretical Chemistry including its historical development.
- (2) Physical Chemistry.
- (3) Inorganic Chemistry.
- (4) Organic Chemistry.

A candidate shall also be required to have a special knowledge, experimental and theoretical, of one of the following subjects the choice of the subject being left to the option of the candidate.

- (1) Biochemistry.
- (2) Chemistry of Plant Products.
- (3) Chemistry of the rarer metals with special reference to those found in Travancore.

A candidate shall give notice through his College, a year before the date of the final examination, of the particular optional subject he proposes to take.

A candidate shall be required to be practically familiar with (a) the ordinary methods of dualitative inorganic analysis (b) the chief volumetric and gravimetric methods of analysis of inorganic compounds including simple gas analysis (c) the methods of detection and estimation of the more important organic radicals and the preparation of pure organic compounds (d) the estimation of carbon, hydrogen, nitrogen, sulphur and halogens in organic compounds and (e) the more important methods of physico-chemical measurements.

### BRANCH IV—BOTANY. (Main).

A candidate for the B. Sc. Honours Degree in Botany shall be required to have made a comprehensive study of the following :—

1. Morphology and Taxonomy of (a) Thallophytes (b) Bryophytes (c) Pteridophytes (d) Gymnosperms and (e) Angiosperms.
2. Ecological and Geographical distribution of Phanerogams with special reference to South India.
3. Fungi with special reference to their relation to plant diseases.
4. Plant Physiology.
5. Plant Anatomy.
6. Physiological Plant Anatomy.
7. Palaeobotany.
8. Cytology and Genetics.
9. Principles of Evolution and Heredity.
10. A study of the principal crop plants of Travancore.

## 11. A Study of the nature and extent of the Forest resources of Travancore.

A candidate shall in addition be expected to have made a special study of any one of the following :—

Cytology.

Plant Breeding.

Genetics.

Wood Technology.

Each candidate shall give notice through his college a year before the date of the final examination, of the particular special subject he proposes to take in the examination.

### BRANCH V—ZOOLOGY. (Main).

I. *Theory.* The course shall comprise the study of

(a) *General Zoology.* The leading features in the structure, development, affinities, distribution and classification of all the groups of the animal kingdom, with an elementary knowledge of the more important fossil forms. A special knowledge of vertebrate embryology based on laboratory studies of the development of a fish, the frog, the chick and the rabbit. A general acquaintance with the vertebrate fauna of South India, particularly of Travancore and with the more important forms of invertebrate animal life occurring in Travancore, special stress being laid on economically important forms.

(b) *General Principles of Biology.*

(i) Cytology—The cell, cell structure, cell division, gametogenesis, parthenogenesis, fertilisation, chromosomes and their bearing on heredity.

(ii) Genetics—The general principles of genetics and their practical applications, Mendelism.

(iii) Geographical distribution—Principles of geographical distributions.

(iv) Evolution—Theories of evolution.

(c) *Special Subject*—Candidates shall be expected to have made a special study of any one of the following applied branches of Zoology based on the text-books prescribed.

1. Marine Zoology

2. Entomology

3. Parasitology.

Each candidate shall give notice through his College, a year before the date of the final examination, of the particular branch he proposes to present.

II. *Practical.* Candidates shall be expected to dissect any of the common types of animals, to identify specimens, to report on Zoological collections, to make microscopic preparation and to cut sections with the microtome.

### SUBSIDIARY SUBJECTS.

The course of study in the Subsidiary subject shall be the same as for the subsidiary subject under Part III of the B. Sc. (Pass) Degree.

3. *Scheme of Examination.* The scheme of examination shall be as follows :—

*Part I. Preliminary Examination.* (held at the end of the first year of the course.)

*English.* There shall be two papers for the Preliminary Examination each of three hours' duration and carrying 100 marks each.

Paper I—English Prose.

Paper II—English Composition.

*Part II Final Examination.*

*Branch I—Mathematics.*

Three papers shall be set in Pure Mathematics, three in Applied Mathematics, and one in each of the optional subjects selected. Each paper shall be of three hours' duration and shall contain questions on the principles developed in the ordinary treatment of the subject as well as exercises of moderate difficulty arising therefrom.

		<i>Hours.</i>	<i>Marks.</i>
1.	Pure Mathematics I	3	200
2.	Do. II	3	200
3.	Do. III	3	200
4.	Applied Mathematics I	3	200
5.	Do. II	3	200
6.	Do. III	3	200
7.	Optional Subject I	3	200
8.	Optional Subject II	3	200
			<hr/> 1,600

#### BRANCH II—PHYSICS.

The examinations shall be both written and practical and the scheme of examinations shall be as follows :—

	<i>Hours.</i>	<i>Marks.</i>
1. Mechanics of solids and fluids	3	120
2. Properties of Matter and Heat	3	120
3. Sound and Light	3	120
4. Magnetism and Electricity	3	120
5. Modern Physics	3	120
6. Optional Subject	3	150
7. Practical examinations (4 Practicals of 3 hours each)		400
Laboratory Note Books		100
		<hr/> 1250
Subsidiary Subject		150
<b>Total</b>		<hr/> <b>1400</b>

At the Practical Examination, the candidates will be tested not only in their ability to make advanced physical measurements and manipulations but also in their knowledge of routine Laboratory technique.

Each candidate shall submit his Laboratory note books containing the date-wise record of his practical work performed during the period of study for the examination. The record shall be countersigned by the Professor or Professors under whom the candidate has worked to certify it to be *bona fide* record of work performed by the candidate. It shall be submitted on the first day of the Practical examination to the examiners engaged in conducting the practical.

### BRANCH III—CHEMISTRY.

The examination shall be both written and practical and the scheme of examination shall be as follows :-

<i>Written.</i>	<i>Hours.</i>	<i>Marks.</i>
1. General Chemistry	3	150
2. Physical Chemistry	3	150
3. Inorganic Chemistry	3	150
4. Organic Chemistry	3	150
5. Optional subject	3	150
<i>Practical.</i>		
Four Practical examinations of 6 hours' each		400
Laboratory note books		100
		<hr/> 1250
Subsidiary subject		150
	<b>Total</b>	<hr/> 1400

A candidate shall submit his laboratory note-books containing the record of all his practical work performed during the period of study for the examination. The record shall be counter-signed by the Professor or Professors under whom the candidate has worked to certify it to be a *bona fide* record of work performed by the candidate. It shall be submitted on the first day of the practical examination to the examiners engaged in conducting the examination.

### BRANCH IV—BOTANY.

The Examination shall be both written and practical and the scheme of examination shall be as follows :-

<i>A. Written Examination.</i>	<i>Hours.</i>	<i>Marks.</i>
1. Morphology of Angiosperms, Systematic and Economic Botany	3	125
2. Algae and Fungi	3	125

	Hours.	Marks.
3. Pteridophytes, Histology and Physiology	3	125
4. Genetics and Cytology, Palaeobotany Gymnosperms, Principles of Evolution and Heredity	3	125
5. Special Subject.	3	125
<i>B. Practical Examination.</i>		
1. Practical I	3	125
2. Practical II	3	125
3. Practical III	3	125
4. Practical IV	3	125
5. Laboratory Records and plant collections	...	125
		1250
Subsidiary Subject		150
		1400

Each candidate shall submit a collection of named plants collected and preserved by himself. The Laboratory records shall be countersigned by the Professor under whom the candidate has worked to certify it to be a *bonafide* record of work performed by the candidate. It shall be submitted on the first day of the examination to the Examiners engaged in conducting the examination.

#### BRANCH V—ZOOLOGY

The scheme of Examination shall be as follows :

<i>Written Examination.</i>	Hours.	Marks.
Invertebrate Paper I	3	120
" Paper II	3	120
Chordata Paper I	3	120
" Paper II	3	120
General Principles of Biology	3	120
Special Subject	3	120
<i>Practical Examination.</i>		
Practical I	3	120
Practical II	3	120
Practical III	3	120
Practical IV (special subject)	2	100
Laboratory note-books and microslides		70
		1250
Subsidiary subject		150
Total		1400

\* The Collection of microslides which shall ordinarily not exceed 50 should be fairly representative and should include slides prepared in connection with the study of the special subject.

Each candidate shall submit his laboratory note-books and slides on the first day of the practical examination. The note-books shall be countersigned by the Professor or Professors under whom the candidate has worked as a *bonafide* record of work done by the candidate.

### SUBSIDIARY SUBJECTS.

The scheme of examination in the subsidiary subjects shall be the same as for the subsidiary subjects under Part III of the B. Sc. (Pass) Degree.

4. No candidate shall be permitted to undergo the complete Final Examination in Honours more than once. A candidate for the Final Examination shall be permitted to withdraw from the examination, provided he has not sat for the last paper in the examination, and provided he has given notice of withdrawal to the Registrar within three clear days from the date of the last paper which he answered. He shall be permitted to appear again for the Final Examination in the following year without producing any additional certificate of attendance.

5. A candidate for the B. Sc. (Honours) Degree shall be required to appear for the Final Examination in Honours not later than the end of the fourth year after commencing the Honours Degree course in a College.

6. No candidate shall be admitted to the Final Examination in Honours unless he has passed the Preliminary Examination.

7. A candidate for the B. Sc. (Honours) Degree may appear for the examination in the subsidiary at the end of the second year of the course.

8. A candidate who secures not less than 40 per cent. of the aggregate marks in the two papers in the Preliminary Examination shall be declared to have passed the examination. A candidate who secures not less than 60 per cent. of the aggregate marks shall be declared to have passed the examination with distinction.

9. A candidate shall be declared to have passed the B. Sc. (Honours) Examination if he obtains not less than 40 per cent. of the total marks and not less than 30 per cent. in each division of the final examination.

The divisions shall be :—

Branch 1. *Mathematics.*

- (a) Pure Mathematics.
- (b) Applied Mathematics.
- (c) Special Subjects.



## BRANCH II--PHYSICS.

- (a) Written Examination in the Main Subject.
- (b) Practical Examination in the Main subject including Laboratory Note Books.
- (c) Subsidiary subject.

## BRANCH III - CHEMISTRY

Same as for Branch II

## BRANCH IV--BOTANY.

- (a) Written examination in the Main subject.
- (b) Practical examination in the Main subject including Laboratory Note Books.
- (c) Subsidiary subject.

## BRANCH V - ZOOLOGY,

- (a) General Zoology and General Principles (Theory)
- (b) Special subject including the practical therein.
- (c) The Three practicals in General Zoology.
- (d) Subsidiary Subject.

10. Successful candidates in the Examination shall be ranked in the order of proficiency as indicated by the total marks obtained by each candidate and shall be arranged in three classes. Candidates who obtain not less than 60 per cent. of the aggregate marks shall be placed in the first class. Those who obtain less than 60 per cent. but not less than 50 per cent. shall be placed in the second class and all the other successful candidates shall be placed in the third class.

11. In the event of a candidate for the B. Sc. (Honours) Degree Examination failing to satisfy the examiners he may be recommended by them for the B. Sc. Degree provided that he obtains not less than  $33\frac{1}{2}$  per cent. of the total marks and not less than 25 per cent. in each division of the examination. A candidate who having failed completely in the B. Sc. (Honours) Examination desires to appear for the B. Sc. Degree Examination shall be allowed to do so without the production of a further certificate of attendance in a College.

A candidate who presents himself for the B.Sc. (Honours) Degree Examination in any year and withdraws from the same and is prevented from subsequently presenting himself for the Examination within the period prescribed under Ordinance 5 of this Chapter shall be allowed to appear for the B. Sc. Degree Examination without the production of a further certificate of attendance in a College.

Candidates appearing for the B. Sc. degree Examination under this Ordinance shall appear for all parts of the examination and shall take under Part III the same optional subjects which they studied for the Honours Course.

## CHAPTER XXI

## DEGREE OF MASTER OF ARTS (M. A.)

1. A candidate who has passed the B. A. Degree or the B. Sc. Degree Examination of this University or an Examination of some other University accepted by the Syndicate as equivalent thereto shall be permitted to appear for the M. A. Degree Examination of this University after he has undergone the prescribed course of study for a period of not less than two academic years in a College of this University.

2. The courses of studies, syllabuses, subjects for the examination, scheme of marks and time-table, marks qualifying for a pass and divisions of the subjects for the M. A. Degree Examination shall be the same in all Branches as for the Final Examination for the B. A. (Honours) Degree in the subjects in the corresponding branch.

There shall also be a *viva voce* Examination. No fixed proportion of marks shall be assigned to the *viva voce* examination. It is intended to assist the examiners in placing the candidates and shall be held after the examiners have valued the written answers.

## CHAPTER XXII.

## DEGREE OF MASTER OF SCIENCE (M. Sc.)

1. A candidate who has passed the B. A. or B. Sc. Degree Examination of this University or an examination of some other University accepted by the Syndicate as equivalent thereto shall be permitted to appear for the M. Sc. Degree Examination of this University after he has undergone the prescribed courses of study for a period of not less than two academic years in a College of this University provided that a candidate shall be admitted to the M. Sc. Degree course only in the subject which he had selected as his main optional subject under Part III for the B. A. or B. Sc. Examination. He shall be exempted from passing the examination in the subsidiary subject (if any) and shall be credited with the marks (if any) which he obtained in that subject at the B. A. or B. Sc. Degree Examination.

2. The courses of studies, syllabuses, subjects for the examination, scheme of marks and time-tables, marks qualifying for a pass and divisions of the subjects for the M. Sc. Degree Examination shall be the same in all Branches as for the B. Sc. (Honours) Degree in the Main subject in the corresponding branch.

## CHAPTER XXIII.

## DEGREE OF LICENTIATE IN TEACHING.

1. Candidates for the L. T. Degree Examination shall be required to have undergone the prescribed course of study for a period of one academic year after qualifying for a Degree in this University or a Degree in some other University accepted by the Syndicate as equivalent thereto.

2. No candidate shall be admitted to the L. T. Degree Examination unless he forwards before the date of the commencement of the Examination satisfactory evidence of having taken a degree in this University or in some other University accepted by the Syndicate as equivalent thereto.

3. The course shall include :—

(i) A. General Principles of Education.

B. Educational Psychology.

C. General Methods.

D. School Organisation and Hygiene.

E. Methods appropriate to the teaching of *two* of the following subjects :

(a) An Indian Language.

(b) English.

(c) Primary Education.

(d) Mathematics.

(e) Physical Science.

(f) Natural Science.

(g) History.

(h) Geography.

(i) Domestic Science.

(j) Music.

In connection with each of the subjects detailed under E, a special unit of study shall be specified each year for more intensive treatment.

(ii) Practical training, including observation and practice in teaching, the making of teaching equipment and school organisation.

(iii) Candidates shall also undergo courses in (a) Physical Education (b) Art or Music or Crafts as prescribed by the College.

Hours of Work : -

A. General Principles of Education	30	per annum.
B. Educational Psychology	60	do.
C. General Methods	45	do.
D. School Organisation and Hygiene	45	do.
E. Special Methods of Teaching		
(2 subjects)	120	do.
F. Physical Education	60	do.
G. Art, Music or Crafts	60	do.
H. Practical Training (including the giving of not less than 20 lessons by each student)	300	do.
	<hr/>	
	720	

NOTE:—Students should be required to undertake some subject as indicated under G. during the L. T. course and mention of this should find a place in the College Diploma. Extra time should be found for this and the aim of such courses should be to develop interest and capacity rather than to turn of technically qualified teachers in these subjects. Making of teaching equipment in connection with the Special Methods syllabuses should be insisted upon.

#### 4. Scheme of Examination:—

##### *Written Examination.*

	Hours.	Marks.
1. Theory of Education A. B. (This paper shall consist of two questions under A and four questions under B.)	3	100
2. General Methods (C)	2	75
3. School Organisation and Hygiene (D)	2	75
4. Methods of teaching (E) Optional Subject:—Two of the following (As per list under Section 3 (i) E above)	3 each	100 each
Total		450

#### 5. Eligibility for a Pass:—

No candidate shall be admitted to the L. T. Degree unless he has passed the Written Examination and unless his practical work has been declared satisfactory by the Principal of the College.

Provided, however, that a candidate who fails in the Written Examination but whose practical work has been declared satisfactory shall be required to appear again for the Written Examinations only and provided also that a candidate who passes the Written Examination but whose record of practical work has not been satisfactory shall be required to undergo a further course of training in the College for one term and secure a record of satisfactory practical work.

NOTE:—Candidates whose record of practical work has not been satisfactory but who have passed the Written examination for the L. T. Degree may however be granted exemption from attendance in the Training College for a further period of one term as prescribed above if they

have been continuously working as Teachers in recognised schools since appearing for the L. T. Degree Examination. Such candidates shall be required to pass the practical Test in the teaching of the two optional subjects arranged by the University. The fee for the Practical Test shall be B. Rs. 5.

6. A candidate shall be declared to have passed the Written Examination if he obtains (i) not less than 35 per cent. in each of the five papers and (ii) not less than 40 per cent. in the five papers taken together. All other candidates shall be deemed to have failed in the examination.

7. Of the successful candidates those who obtain not less than 60 per cent. of the total marks shall be placed in the first class and those who obtain not less than 50 per cent. of the total marks shall be placed in the second class. The remaining successful candidates shall be placed in the third class. Successful candidates who obtain not less than 60 per cent. of the marks in a paper relating to 4 (Methods of Teaching shall be declared to have obtained distinction in the subject."

8. The examination for the L. T. Degree under the Scheme in force in 1938-39 shall be held in 1940 and 1941, for the benefit of those candidates who have undergone the L. T. Degree course under the above Scheme.

## CHAPTER XXIV.

### DEGREE OF BACHELOR OF LAWS.

1. The course of study for the Bachelor of Laws Degree shall consist of two parts:

*Part I. The First Examination in Law.*

*Part II. Bachelor of Laws Degree Examination.*

#### FIRST EXAMINATION IN LAW.

2. No candidate shall be admitted to the First Examination in Law unless he has undergone a course of study in the subjects prescribed for the examination for a period of one academic year after qualifying for the Degree of Bachelor of Arts or Bachelor of Science of this University or a Degree of some other University accepted by the Syndicate as equivalent thereto.

3. Candidates for the First Examination in Law shall be examined in the following subjects:—

- (i) Jurisprudence
- (ii) Roman Law
- (iii) The Law of Contracts including Negotiable Instruments and Specific Relief
- (iv) The Law of Torts
- (v) Indian Constitutional Law

The examination shall consist of six papers as follows:—

	Hours.	Marks.
(i) Jurisprudence	3	100
(ii) Roman Law	3	100
(iii) The Law of Contracts etc., I	3	100
(iv) Do. II	3	100
(v) The Law of Torts	3	100
(vi) Indian Constitutional Law	3	100
Total		600

4. A candidate shall be declared to have passed the examination if he obtains not less than forty per cent. of the total marks, and not less than one-third of the marks in each division of the examination. The divisions shall be as follows:—

- (i) Jurisprudence, Roman Law and Indian Constitutional Law.
- (ii) The Law of Contracts, including Negotiable Instruments and Specific Relief and the Law of Torts.

All other candidates shall be deemed to have failed in the Examination.

5. Successful candidates who obtain not less than 60 per cent. of the total marks shall be placed in the first class. Successful candidates who obtain less than 60 per cent. but not less than 50 per cent. of the total marks shall be placed in the second class. All other successful candidates shall be placed in the third class.

#### B. L. DEGREE EXAMINATION.

6. No candidate shall be admitted to the B. L. Degree Examination unless he has undergone a course of study in the subjects prescribed for the examination for a period of one academic year after passing the First Examination in Law or an examination recognised by the Syndicate as equivalent thereto.

7. Candidates for the B. L. Degree Examination shall be examined in the following subjects:—

(i) The Law of Property with special reference to the transfer of Property Act, the Indian Trusts Act and the Indian Easements Act.

Questions shall ordinarily be set only on such parts of the English Law of Property as deal with the general principles of the Law of Property and are calculated to enable students to appreciate the Indian Law of Property.

(ii) Hindu Law (including Marumakkathayam law)

(iii) Muhammadan Law

(iv) The principles of Land Tenures

NOTE:—The subject will include Madras Land Tenures, Madras Estates Land Act, Malabar Tenancy Act and the Travancore and Cochin Tenancy Acts.

(v) The Law of evidence

(vi) Criminal Law (Indian Penal Code)

The Examination shall consist of 7 papers as follows:—

	Hours.	Marks.
(i) The Law of Property I	3	100
(ii) Do. II	3	100
(iii) Hindu Law III	3	120
(iv) Muhammadan Law	2	80
(v) Principles of Land Tenures	2	70
(vi) The Law of Evidence	2	80
(vii) Criminal Law	3	100
Total		650

8. A candidate shall be declared to have passed the Examination if he obtains not less than forty per cent of the total marks and not less than one third of the marks in each division of the Examination. The division shall be as follows:—

- (i) The Law of Property and Land Tenures
- (ii) Hindu Law and Muhammadan Law
- (iii) Criminal Law and the Law of Evidence

All other candidates shall be deemed to have failed in the Examination.

9. Successful candidates who obtain not less than 60 per cent. of the total marks shall be placed in the first class. Successful candidates who obtain less than 60 per cent. but not less than 50 per cent. of the total marks shall be placed in the second class. All other successful candidates shall be placed in the third class.

## CHAPTER XXV.

## TITLES IN ORIENTAL STUDIES.

*Mahopadhyaya.*(Sanskrit).<sup>1</sup>

1. Candidates for Mahopadhyaya Title shall be required to have passed the Sanskrit Entrance Examination conducted by this University or an examination accepted by the Syndicate as equivalent thereto and to have subsequently undergone the prescribed course of study for a period of four academic years in an institution approved by the Syndicate for the purpose and passed the prescribed examination.

2. The Mahopadhyaya course shall consist of two parts *viz.*, Preliminary and Final. The Preliminary Examination shall be held at the end of the second year of the course and the final examination at the end of the fourth year of the course.

3. No candidate shall be admitted to the Final Examination until he has passed the Preliminary Examination.

## THE SANSKRIT ENTRANCE EXAMINATION.

4. The Sanskrit Entrance Examination will be held annually at Trivandrum and will be open to all persons who have passed the Sastri Test conducted by the Travancore Education Department or an examination accepted by the Syndicate as equivalent thereto.

5. The subjects for the examination shall be :--

- (1) Sahitya,
- (2) Vyakarana,
- (3) Nyaya and Mimamsa,
- (4) English.

6. Candidates who secure not less than 30 per cent. of the marks in each subject and 35 per cent. of the total marks shall be declared to have passed the Entrance Examination and to be eligible for admission to the Mahopadhyaya course.

## MAHOPADHYAYA PRELIMINARY EXAMINATION.

7. The course of study for the Preliminary Examination shall consist of two parts.

*Part I*---General and

*Part II*---Special.



**General.** (i) Prescribed text-books relating to the elements of Nyaya, Mimamsa and Vyakarana.

(ii) Prescribed text-books from the Mantras, the Brahmanas, the Upanisheds, the Grhya and the Dharma Sutras and the Smritis.

**Special.** One of the following branches of study may be selected by the candidates at his option :—

BRANCH I. *Nyaya*. Prescribed text-books relating to the Nyaya and Vaisesika Darsanas including select portions of Purvavada.

BRANCH II. *Vyakarana*. Prescribed text-books relating to advanced Vyakarana, including selected portions of standard commentaries on the Sidhanta Kaumudi.

BRANCH III. *Sahitya*. Prescribed Kavvas and Natakas and a simple work in Poetics.

BRANCH IV. *Jyotisa*. Prescribed text-books in Jyotisa and Ganita.

BRANCH V. *Vedanta*. Prescribed text-books relating to the Bhasyaprasthana of one of the three South Indian Schools of Vedanta viz., Advaita, Visistadvaita and Dvaita.

BRANCH VI. *Mimamsa*. Prescribed text-books relating to Purvamimamsa, Veda Sruta and Dharma Sastra.

#### MAHOPADHYAYA FINAL EXAMINATION.

8. The course of study for the Final Examination shall consist of two parts,

*Part I.* General, and

*Part II.* Special.

**General.** The History of Sanskrit Language and Literature.

**Special.** One of the following branches of study may be selected by the candidate at his option :

BRANCH I. *Nyaya*. Prescribed text-books relating to Nyaya and Vaisesika Darsanas including select portions of Uttaravada and of the Sabdabodha works in Nyaya and Mimamsa.

BRANCH II. *Vyakarana*. Prescribed text-books relating to advanced Vyakarana including Subdabodha works in Vyakarana and select portions of Mahabhasya and standard commentaries on the Sidhanta Kaumudi.

- BRANCH III. *Sahitya*. (a) Prescribed text-books relating to Grammar, Prosody and Poetics; and (b) prescribed text-books of advanced character relating to *Alankara Sastra*.
- BRANCH IV. *Jyotisa*. Prescribed text-books of an advanced character in *Jyotisa* and *Ganita*.
- BRANCH V. *Vedanta*. Prescribed text-books relating to (a) the *Vedaprasthana* of one of the three South Indian Schools of *Vedanta* and (b) the *Yoga*, *Samkhya* and the elements of the three South Indian Schools of *Vedanta*.
- BRANCH VI. *Mimamsa*. (a) Prescribed text-books relating to *Purvamimamsa* and (b) the application of *Mimamsa* to *Vedic exegesis* and to the proper comprehension of the social and the legal aspects of the *Dharma Sastras*.

9. The Scheme of Examination for the Mahopadhyaya Title shall be as follows :—

PRELIMINARY EXAMINATION.

			Hours.	Marks.
Prescribed Text-Books.				
	General	I	3	200
Do.	Do.	II	3	200
Do.	Special	I	3	150
Do.	Special	II	3	150
Total				700

FINAL EXAMINATION.

History of Sanskrit Language and Literature			3	200
Prescribed Text-Books				
	Special	I	3	200
	Do.	II	3	200
	Do.	III	3	200
Total				800

10. A candidate shall be declared to have passed the preliminary or the Final Examination, as the case may be, if he obtains not less than 40 per cent. of the total marks in that examination.

A candidate who obtains not less than 60 per cent. of the total marks for the final examination shall be declared to have passed the examination with distinction.

11. Any person who has qualified for the Mahopadhyaya Title in any one of the special branches of study prescribed may be permitted to further qualify in any other branch without undergoing a course in an approved institution.

Such a candidate shall be required to pass an examination consisting of the question-papers in the newly-selected branch under Part II for both the Preliminary and Final Examination.

A candidate who secures 60 per cent. of the total marks in the examination shall be declared to have passed with distinction in that branch.

#### SAHITYAVISARADA.

12. Candidates for the Sahityavisarada Examination shall offer Malayalam as the Main Language, English as compulsory Second Language and Sanskrit or Tamil as subsidiary language.

13. The duration of the course of study shall be two years and it shall be pursued in an institution or institutions approved by the Syndicate. Candidates may also appear for the examination privately, two years after passing the qualifying examination.

14. Admission to the course shall be open to candidates who are successful in the Malayalam or Tamil High School examinations or the Sastri test of the Education Department.

15. The course of studies for the examination shall be as follows:—

- (a) Poetry—Prescribed text-books in (i) Early (ii) Medieval and (iii) Modern Poetry.
- (b) Prose—Prescribed text-books in (i) Early Prose including inscriptions and documents (ii) Medieval Prose and (iii) Modern Prose.
- (c) Grammar—History of Language, Rhetoric, Poetics and Prosody.
- (d) History of Literature.
- (e) Composition.
- (f) Compulsory Second Language—English (standard of Forms four and five of English High Schools).
- (g) Subsidiary Language—Tamil or Sanskrit.  
(Tamil—VIII Class standard.  
Sanskrit—VI Form standard.)

16. The scheme of examination shall be as follows :-

<i>Subject.</i>	<i>Duration.</i>	<i>Marks.</i>
1 Prescribed text-books in Poetry	3 hours	150
2 Do. Prose	3 „	150
3 History of Language, Grammar, etc.	3 „	150
4 History of Literature	3 „	150
5 Composition	3 „	100
6 Tamil or Sanskrit (Subsidiary)	3 „	100
7 Compulsory Second Language (English)	3 „	100
Total		900

17. All the papers in the Examination shall be set and answered in the respective languages to which they relate provided that the paper in Sanskrit as the Subsidiary language shall be set in Sanskrit and answered in the main language.

18. A candidate shall be declared to have passed the examination if he obtains not less than 40 per cent. in division (1), 30 per cent. in division (2) and 30 per cent. in division (3). The divisions shall be: -

- 1 Malayalam (Papers Nos. 1 to 5.)
- 2 Tamil or Sanskrit—Subsidiary (Paper No. 6.)
- 3 Compulsory Second Language—English (Paper No. 7)

19. Successful candidates in the Examination shall be ranked in the order of proficiency as indicated by the total marks obtained by each candidate and shall be arranged in three classes. Candidates who obtain not less than 60 per cent. of the aggregate marks shall be placed in the First Class. Those who obtain less than 60 per cent. but not less than 50 per cent. shall be placed in the Second Class and all other successful candidates shall be placed in the Third Class.

#### VIDVAN.

20. Candidates for the Vidvan Examination in Tamil shall offer Tamil as the main language, English as compulsory Second Language and Malayalam or Sanskrit as Subsidiary Language.

21. The duration of the course of study shall be two years and it shall be pursued in an institution or institutions approved by the Syndicate. Candidates may also appear for the examination privately, two years after passing the qualifying examination.

22. Admission to the course shall be open to candidates who are successful in the Tamil or Malayalam High School Examination or the Sastri test of the Education Department.

23. The course of studies for the examination shall be as follows: —

- I. *Tamil* (Main) (a) *Poetry*. Prescribed text-books in (i) Early (ii) Medieval and (iii) Modern Poetry.
- (b) *Prose*. (i) Early Prose (including inscriptions and documents of the early periods) (ii) Medieval Prose and (iii) Modern Prose. Tamil Drama will be included in this paper.
- (c) *Grammar*. History of Language, Rhetoric, Poetics and Prosody
- (d) History of Literature.
- (e) Composition.
- II. Compulsory Second Language—English (of the standard of Forms IV and V of English High Schools).
- III. Malayalam or Sanskrit (Subsidiary)  
(Malayalam Class VII Standard)  
(Sanskrit—VI Form Standard).

24. The scheme of examination shall be as follows :

	<i>Subject.</i>	<i>Duration,</i>	<i>Marks.</i>
1	Prescribed text-books in Poetry	3 hours	150
2	do. do. Prose	3 "	150
3	History of Language, Grammar etc.	3 "	150
4	History of Literature	3 "	150
5	Composition	3 "	100
6	Malayalam or Sanskrit (Subsidiary)	3 "	100
7	Compulsory Second Language (English)	3 "	100
Total			900

25. All the papers in the Examination shall be set and answered in the respective languages to which they relate provided that the paper in Sanskrit as the Subsidiary language shall be set in Sanskrit and answered in the main language.

26. A candidate shall be declared to have passed the examination if he obtains not less than 40 per cent. of the marks in division (1) and 30 per cent. each of the marks in divisions (2) and (3) of the examination. The divisions shall be as follows :—

- 1 Tamil (Papers Nos. 1 to 5).
- 2 Malayalam or Sanskrit (Subsidiary) (Paper No. 6.)
- 3 Compulsory Second Language—English (Paper No. 7).

27. Successful candidates in the examination shall be ranked in the order of proficiency as indicated by the total marks obtained by each

candidate and shall be arranged in three classes. Candidates who obtain not less than 60 per cent. of the aggregate marks shall be placed in the First Class. Those who obtain less than 60 per cent. but not less than 50 per cent. shall be placed in the Second Class and all other successful candidates shall be placed in the Third Class.

## CHAPTER XXVI.

### RESEARCH STUDIES.

1. Any person, who is granted permission by the Syndicate to carry out research in the University, shall be enrolled as a Research Student.

2. A Research Student shall work under the supervision of a Teacher of the University recognised by the Syndicate for the purpose.

3. Application for admission as a Research Student must be made to the Registrar and must be accompanied by (a) a diploma or other certificate showing that the applicant has qualified for a Degree of a recognised University, (b) a statement of the course of Research which the applicant desires to pursue together with such evidence of qualifications, attainments and previous study as will show the capacity of the applicant to undertake the proposed course of Research and (c) a certificate from a recognised Teacher of the University who is willing to supervise the work of the applicant.

4. In exceptional cases, persons, who have not qualified for a Degree may be admitted as Research Students, provided that they produce other evidence of general educational qualification and of special fitness to undertake the proposed research work.

5. Admission will be given for a period of one year in the first instance, but it may be extended from time to time on the recommendation of the Supervising Teacher.

6. Research Students shall be required to pay a fee, prescribed from time to time, which shall admit them to all privileges of University Students, except those for which special fees are charged. Research Students who have already qualified for a Research Degree of the University may, however, be exempted by the Syndicate from the payment of fees in special case.

7. The Supervising Teacher shall send, at the close of each year and may send at any other time, reports of progress of Research Students working under him. The Syndicate may remove from the roll of Research Students the name of any person for unsatisfactory progress or conduct.

**B. SCHOLARSHIPS, FELLOWSHIPS, GRANT-IN-AID  
OF RESEARCH AND PRIZES FOR  
ORIGINAL WORKS.**

8. Awards-in-aid of Research shall be of three kinds :—  
 (i) University Research Scholarships and Fellowships.  
 (ii) Endowed Research Scholarships and Fellowships.  
 (iii) Special Grants and Prizes.

**UNIVERSITY RESEARCH SCHOLARSHIPS AND FELLOWSHIPS.**

9. The award of Research Scholarships and Fellowships shall rest with the Syndicate.

10. The minimum qualification for the award of a Research Scholarship will be a Degree of a recognised University with at least Second Class marks in the subject in which Research is proposed to be undertaken.

11. The minimum qualification for the award of a Fellowship shall be a Research Degree of a recognised University.

12. Application for Research Scholarships and Fellowships must be made to the Registrar, in the prescribed form, and must be accompanied by :—

(a) A diploma and other certificates showing that the applicant possesses the minimum qualifications prescribed above ;

(b) A statement of the course of Research which the applicant desires to pursue together with such evidence of qualifications, attainments and previous study as will show the capacity of the applicant to undertake the proposed course of Research ; and

(c) A certificate from a recognised Teacher of the University, who is willing to supervise the work of the applicant.

13. The applications for Scholarships and Fellowships shall be considered and reported upon by the Dean of the Faculty in consultation with the chairman of the Board of Studies dealing with the subject concerned and the supervising teacher.

14. The Syndicate shall from among the candidates recommended by the Deans of Faculties select as many persons as there are vacancies to work as Scholars and Fellows on probation for a period of six months. No allowance will be disbursed during the probationary period.

15. At the close of the probationary period, the Syndicate shall consider the reports of progress made by the Supervising Teachers and shall confirm the award on those Scholars and Fellows, whose work is judged to be satisfactory. The stipend for the entire probationary period shall then be disbursed.

16. Each Scholar and Fellow shall enter into a bond with the University, the terms of which shall be settled by the Syndicate, and shall agree to engage himself in whole-time Research work during the period of his tenure and to refund to the University the amount of stipend drawn by him in case of (i) resignation before the expiry of his tenure, or (ii) of its forfeiture on account of misconduct or for unsatisfactory progress.

17. The tenure of each Research Scholarship shall be for a period of two years; but it may be extended by the Syndicate for a further period of one year. The tenure for each Research Fellowship shall be for a period of one year; but it will ordinarily be extended for a further period of one year if the report of progress is satisfactory.

18. Each Research Scholar or Fellow shall work under the supervision of a Teacher, recognised for the purpose by the Syndicate. The Supervising Teacher shall send a quarterly report to the Syndicate on the progress of the Scholars or Fellows working under him.

19. The Syndicate may suspend or cancel a Scholarship or Fellowship at any time on account of misconduct or unsatisfactory progress and may require the holder to refund the whole or part of the stipend drawn. The decision of the Syndicate shall be final.

20. At the end of each year and at any other time when the Syndicate may so require, a Scholar or a fellow shall submit through the Supervising teacher, four copies of a report embodying the results of his Researches so far as they have progressed. It shall be open to a Scholar or a Fellow to submit such a report any other time.

21. A Scholar or a Fellow shall not join a course of studies in the University except with the approval of the Syndicate.

22. A Scholar or a Fellow shall not be permitted to accept any appointment, full-time, part-time, or honorary, during the period of his tenure.

23. Each Research Scholar shall be required to deliver a short course of lectures, not less than two and not exceeding four, during the second and subsequent years of his tenure, on the subject of his work.

24. Each Research Fellow shall be required to deliver a short course of lectures not less than three and not exceeding six, during the first and subsequent years of his tenure, on the subject of his work.

25. Each Scholar or Fellow shall be a full-time servant of the University. Besides the prescribed holidays, leave for urgent reasons may be granted to Scholars and Fellows for a period not exceeding 14 working days in the year and not exceeding 14 Calendar days consecutively, by the Supervising Teacher.

26. On sufficient cause shown leave may be granted to a Scholar or a Fellow by the Syndicate with stipend for a period not exceeding one



calendar month, and without stipend, for a further period of one month during any academic year.

27. A Scholar or a Fellow may not, ordinarily resign his appointment during the course of an academic year, to accept another post. He shall be required to refund the whole or any portion of the stipend drawn by him, if he leaves his work without the previous sanction of the Syndicate.

28. Scholarships and Fellowships shall be tenable only in approved institutions in Travancore, but, in exceptional cases, Scholars and Fellows may be deputed by the Syndicate to work in other institutions in India and/or abroad. The Syndicate may sanction a grant-in-aid to supplement the emoluments of a Scholar or a Fellow to work outside Travancore.

29. A Scholar or a Fellow shall not publish, during his tenure, any results of his investigation except with the approval of the Syndicate and on the advice of the Supervising Teacher. A suitable acknowledgment of the aid received from the University shall be made whenever the results are published and four copies of the book, memoir or paper shall be furnished free of cost to the University.

30. The Syndicate may not award a Scholarship or a Fellowship in any year, if, in its opinion, there are no deserving applicants.

31. Casual or other vacancies during the course of the academic year among Scholars and Fellows may not be filled up by a fresh award. A vacant Fellowship may, however, be awarded to a Scholar, who is otherwise eligible.

#### ENDOWED RESEARCH SCHOLARSHIPS AND FELLOWSHIPS.

32. The award of Endowed Scholarships and Fellowships will be made according to the terms of each endowment and the rules mentioned above for the award of University Scholarships and Fellowships, where not repugnant to the terms of the endowment.

#### SPECIAL GRANTS AND PRIZES IN AID OF RESEARCH.

33. Grants-in-aid to cover expenses in connection with Research or for the publication of Research work may be given at the discretion of the Syndicate to persons who are not full-time Research Scholars or Fellows.

34. The award of such grants-in-aid shall be made in consultation with the Board of Studies dealing with the subject of the Research.

35. The Syndicate may require the recipient of the grant-in-aid to enter into a bond with the University, the terms of which may be settled by the Syndicate.

36. It shall be obligatory for the recipient to acknowledge the aid when publishing the work, in respect of which the aid was given, and to furnish, free of cost, four copies of the publication to the University.

37. The Syndicate may, from time to time, institute special prizes for encouraging original research and may prescribe the rules for the award of such prizes.

## CHAPTER XXVII.

### COURSES IN TEXTILE TECHNOLOGY AND TEXTILE CHEMISTRY.

#### (a) DIPLOMA COURSES.

1. The Diploma Courses in Textile Technology and Textile Chemistry will extend over a period of three years.

2. Admission to the Course will be open only to holders of the English School Leaving Certificate, who have been declared eligible for admission to a University Course of Study and who have obtained not less than 50 per cent. of the total marks and not less than 60 per cent. in Elementary Mathematics and Elementary Science combined, and to persons who may possess equivalent or higher qualification.

3. The courses in Textile Technology and Textile Chemistry shall consist of theoretical and practical instruction in the following subjects.

- |  |   |
|--|---|
| i. Mathematics.                        | xii. Design and Analysis of cloth.  |
| ii. Mechanics.                         | xiii. Preparation of yarns and fabrics including sizing, mercerising, bleaching, dyeing, printing, and finishing. |
| iii. Chemistry.                        | xiv. Industrial Economics.  |
| iv. Physics.                           | xv. Descriptive Engineering.  |
| v. Freehand Drawing.                   | xvi. Workshop Practice.   |
| vi. Model Drawing.                     |   |
| vii. Machine Drawing.                  |   |
| viii. Spinning and Weaving.            |   |
| ix. Textile Fibres.                    |   |
| x. Fabric Structure                    |   |
| xi. Spinning and Weaving calculations. |   |

The course in Technology shall include advanced instruction in spinning, sizing and weaving.

The course in Textile Chemistry shall include advanced instruction in spinning, sizing and weaving.

The course in Textile Chemistry shall include advanced instruction in Colour Chemistry, Chemical Engineering, Bleaching, Dyeing, Printing and Finishing.

The scope of each subject will be indicated by a syllabus prescribed from time to time.

4. The examination shall consist of two parts : —

Part I—First Examination in Textile Technology or Textile Chemistry.

Part II—Diploma Examination in Textile Technology or Textile Chemistry.

#### SCHEME OF EXAMINATION.

5. The scheme of examination shall be as follows :

**Part I—First Examination in Textile Technology or Textile Chemistry.**

The First Examination in Textile Technology or Textile Chemistry shall be held at the end of the second year of the Diploma course. There shall be a written and a practical examination.

#### A. WRITTEN EXAMINATION.

<i>Subject.</i>	<i>Hours.</i>	<i>Marks.</i>
i. Mathematics	3	75
ii. Physics and Mechanics	3	75
iii. Chemistry Paper I (Inorganic)	2	50
iv. Chemistry Paper II (Organic)	2	50

#### B. PRACTICAL EXAMINATION.

<i>Subject.</i>	<i>Hours.</i>	<i>Marks.</i>
v. Physics	3	50
vi. Chemistry (Inorganic)	3	30
vii. Chemistry (Organic)	3	20
viii. Freehand Drawing	2	50
ix. Model Drawing	2½	50
<b>Total</b>		<b>450</b>

**Part II—Diploma Examination in Textile Technology or Textile Chemistry.**

The Diploma Examination in Textile Technology or Textile Chemistry shall be held at the end of the 3rd year of the course.

#### TEXTILE TECHNOLOGY.

The Examination shall consist of the following papers :

<i>Subject.</i>	<i>Hours.</i>	<i>Marks.</i>
i. Sizing	2½	50
ii. Machine Drawing	3	50
iii. Technology of Bleaching and Finishing Paper I	2½	75
iv. Weaving Paper I	2½	75
v. Weaving Paper II	3	100
vi. Dyeing and Printing Paper I	2½	50
vii. Spinning Paper I	2	50
viii. Spinning Paper II	3	100
ix. Practical Examination in Weaving	4	75
x. Practical Examination in Spinning	4	75
		<b>700</b>

## TEXTILE CHEMISTRY.

The Examination shall consist of the following papers :

<i>Subject.</i>	<i>Hours.</i>	<i>Marks</i>
i. Sizing	2½	50
ii. Machine Drawing	3	50
iii. Technology of Bleaching and Finishing Paper I	2½	75
iv. Weaving Paper I	2½	75
v. Technology of Bleaching and Finishing Paper II	3	75
vi. Dyeing and Printing Paper I	2½	50
vii. Spinning Paper I	2	50
viii. Dyeing and Printing Paper II	4	75
ix. Colour Chemistry	2½	70
x. Chemical Engineering	1½	30
xi. Practical Examination in Bleaching, Dyeing, Printing, etc.	3	100
Total		700

(Note : —The question papers in i, ii, iii, iv, vi, and vii shall be common to the Diploma Examinations in Textile Technology and Textile Chemistry.)

6. A candidate who obtains not less than 40 per cent. of the aggregate marks and not less than 35 per cent. each in A and B of the First examination in Textile Technology or Textile Chemistry shall be declared to have passed the Examination. A candidate who secures not less than 60 per cent. of the aggregate marks shall be declared to have passed the Examination with distinction.

7. The marks obtained at the First Examination shall be added to the marks obtained at the Diploma Examination. The total number of marks for the two Examinations together, i. e., 1150 will be the grand total of marks for determining the results of the Diploma Examination.

8. A candidate who has passed the First Examination in Textile Technology or Textile Chemistry and obtains not less than 40 per cent. of the grand total and not less than 35 per cent. of the total number of marks of the Diploma Examination shall be declared to have passed the Examination. Those who obtain not less than 60 per cent. of the grand total shall be declared to have passed the Examination with distinction.

9. It will be open to the Board of Examiners to recommend the award of a Certificate in Textile Technology or Textile Chemistry to deserving candidates among those who, having passed Part I, fail in Part II. Such candidates will, however, be permitted to qualify themselves for the Diploma by passing Part II of the Examination.

10. Candidates who fail in the First Examination in Textile Technology or Textile Chemistry will be allowed to continue their studies in the 3rd year of the Diploma course and such candidates will be permitted to appear for both Parts in the same year.

### (b) CERTIFICATE COURSES.

11. The Certificate courses shall extend over a period of two years.

12. Admission to the courses will be open only to persons who have at least completed the English Secondary School Leaving Course.

13. There shall be the following Certificate Courses.

- i. Textile Technology.
- ii. Textile Chemistry.
- iii. Workshop Practice.
- iv. Embroidery and Knitting.

The schemes of examination shall be as follows:-

<i>Textile Technology.</i>	<i>Hours.</i>	<i>Marks.</i>
Weaving I.	3	100
Do. II.	3	100
Practical Examination in Weaving	3	100
Sizing	2	100
Bleaching and Finishing	2	100
Dyeing and Printing	3	100
Mathematics	3	100
Physics	3	100
Inorganic Chemistry	3	100
Organic Chemistry	3	100
Practical Examination in Freehand	2	100
Drawing.		
Do. Model Drawing	3	100
Do. Physics	3	100
Do. Chemistry	3	100
<i>Textile Chemistry.</i>		
Weaving	3	100
Sizing	2	100
Bleaching and Finishing I	2	100
Do. II	3	100
Dyeing and Printing I	3	100
Do. II	3	100
Practical Examination in Bleaching		
Dyeing and Printing	3	100
Mathematics	3	100
Physics	3	100
Inorganic Chemistry	3	100

	<i>Hours.</i>	<i>Marks.</i>
Organic Chemistry.	3	100
Practical Examination in Freehand Drawing	2	100
Do. Model Drawing.	3	100
Do. Physics.	3	100
Do. Chemistry.	3	100

*Embroidery and Knitting.*

Knitting (Theory).	2	100
Embroidery do.	2	100
Practical Examination in Knitting.	3	100
Do. Embroidery.	4	100
Bleaching, Dyeing and Printing (Theory)	2	100
Practical Examination in Drawing	2	100
Mathematics and Mechanics.	2	100
Practical Examination in Bleaching Dyeing and Printing.	4	100

14. A candidate shall be declared to have passed the examination if he obtains not less than 35 per cent. in each group and not less than 50 per cent. of the total marks. Candidates who obtain not less than 60 per cent. of the total marks shall be placed in the First Class. All other successful candidates shall be placed in the Second class.

The groups shall be as follows : --

*Textile Technology.*

Group A -- Weaving I Paper.  
Weaving II Paper.  
Weaving Practical.  
Sizing.

Group B—Bleaching and Finishing I Paper.  
Dyeing and Printing I Paper.

Group C—Mathematics.  
Physics.  
Inorganic Chemistry.  
Organic Chemistry.  
Freehand Drawing.  
Model Drawing.  
Physics Practical.  
Chemistry Practical.

*Textile Chemistry.*

Group A—Weaving I Paper.  
Sizing.

Group B—Bleaching and Finishing I Paper,

Bleaching and Finishing II Paper.  
 Dyeing and Printing I Paper.  
 Do. II Paper.  
 Bleaching, Dyeing and Printing Practical.

Group C—Mathematics.

Physics.  
 Inorganic Chemistry.  
 Organic Chemistry.  
 Freehand Drawing.  
 Model Drawing.  
 Physics, Practical.  
 Chemistry, Practical.

*Embroidery and Knitting.*

Group A—Knitting Theory.

Embroidery Theory.  
 Knitting Practical.  
 Embroidery Practical.

Group B—Bleaching, Dyeing and Printing.

Drawing.  
 Mathematics and Mechanics.  
 Bleaching, Dyeing and Printing (Practical).

## CHAPTER XXVIII.

### QUALIFICATIONS OF TEACHERS.

1. *Teachers in Arts and Science Colleges.*—A First or Second class in the B. A. Honours or M. A. or B. Sc. Honours or M. Sc. Degree Examination in the subject proposed to be taught.

Persons who have obtained a First or Second class B. A. or B. Sc. Degree or a Third class Honours or M. A. or M. Sc. Degree may however, be appointed as Tutors or Demonstrators.

Such Tutors or Demonstrators shall not be given any lecturing work; they may be entrusted with the correction of essays or exercises or the supervision of translation work or practical work in laboratories, in the Intermediate classes.

Teachers in Sanskrit, Malayalam and Tamil should possess the following qualifications :—

*Teachers in Sanskrit.*

(i) First Class Mahopādhyaya or Siromani.

(ii) M. A. or B. A. (Hons.) <sup>or</sup> with Sanskrit as main language.

(iii) B. A. with First or Second class under Part III Sanskrit. <sup>or</sup>

*Teachers in Malayalam.*

- (i) M. A. in two languages—Malayalam and Sanskrit or Malayalam and Tamil

or

- (ii) B. A. (Hons.) or M. A., in Malayalam Language and Literature.

or

- (iii) B. A. with First or Second Class under Part III—Malayalam.

or

- (iv) M. A. in Sanskrit with sufficient knowledge of Malayalam literature.

*Teachers in Tamil.*

- (i) M. A., or B. A., (Hons.) in Tamil Language and Literature

or

- (ii) B. A., with First or Second Class under Part III—Tamil.

2. *Heads of the Departments*—Only persons who have obtained a first or second class Honours Degree or a first or second class master's Degree and who have had at least four years' teaching experience shall be recognised as Heads of Departments in colleges.

It shall be open, however, to the Syndicate to approve the appointment, as Head of a Department for the B. A. or B. Sc., Pass Course, of a person who has obtained a third class Honours Degree and who has not less than seven years' teaching experience.

In the case of the Head of the Department in any of the languages, a minimum experience as a teacher of the Language in College classes for at least five years is necessary in addition to the qualifications prescribed in Section 1.

3. *Physical Training Directors* shall be graduates who possess a Certificate of a recognised College of Physical Training.

4. *Teachers in the Training College* :—An Honours or Master's Degree and first or second class L. T. Degree or qualifications accepted by the Syndicate as equivalent thereto.

5. *Teachers in the Law College* :—The B. L. Degree (First or second class) or the M. L. Degree and not less than five years' experience at the bar, or the Law Degrees of the Universities of London, Oxford, Dublin, Cambridge and the qualification of Barrister-at-law, Inns of Court, London, together with three years' experience at the bar.

*Note* :—The qualification, Barrister-at-Law, shall be recognised only where the person has taken also a University Degree in Law.



6. In exceptional cases, the Syndicate may sanction, for a specific period, appointments not in conformity with the above rules.

7. Notwithstanding anything contained in the foregoing Ordinances, Teachers in Colleges who have been already recognised by the Syndicate of the Madras University as competent to teach in Honours, Pass or Intermediate Classes, as the case may be shall be recognised as teachers competent to teach in the respective classes in this University also.

#### 8. *Teachers in the Engineering College.*

Only persons who possess the qualifications specified below shall ordinarily be appointed as Teachers in the Engineering College.—

*Professor*:—An Honours or a First Class Engineering Degree of a recognised University in the subject proposed to be taught with at least 5 years' teaching experience and practical and/or research experience.

*Lecturer*:—An Honours or a First Class (or Second Class, where there are 3 classes) Engineering Degree of a recognised University in the subject proposed to be taught with practical experience and preferably some teaching experience.

*Senior Workshop Instructor*:—A Diploma in Engineering with at least 5 years' practical experience in Mechanical Workshops of recognised standing.

(Note.—The above Ordinances shall not affect the present members of the staff of the College of Engineering *i. e.* the staff appointed before 24.1.1942.)

#### 9. *Teachers in the Institute of Textile Technology.*

*Professor of Textile Technology*:—A Degree or Diploma in Textiles from a recognised University or College in Europe or America with practical experience in mills

*Finishing Master*:—B. Sc. (Tech.) of the Bombay University or of any other University or the L. T. C. of the Victoria Jubilee Technical Institute, Bombay, or any other Diploma in Textile Chemistry (Bleaching, Dyeing, Printing and Finishing) from a recognised Technical Institute in India or abroad with at least two years' practical experience in a mill.

*Textile Assistant*:—L. T. M. of the Victoria Jubilee Technical Institute, Bombay, with at least two years' practical experience in a mill or other equivalent qualifications.

## CHAPTER XXIX.

## TRANSITORY PROVISIONS.

Notwithstanding anything contained in the previous Chapters of the Ordinances, candidates entitled to be admitted for the whole or a part of the Examinations conducted by the University of Madras, prior to the holding of the corresponding examinations of the Travancore University for the first time, will be eligible for admission to the whole or part of the respective examinations conducted by the Travancore University, provided that they had qualified to take these examinations as students of the College maintained by or admitted to the privileges of the Travancore University, and provided that they do not appear for any part or whole of the examinations conducted by the University of Madras after the first corresponding examinations of this University are held. If a candidate has passed any part or parts of the examinations conducted by the Madras University, he will be exempted from passing the corresponding part or parts of the examinations of the Travancore University. If a candidate has passed any part or parts of the examinations of the Madras University and passes in the other part or parts in the Travancore University, he shall be deemed to have passed the whole examination in the Travancore University.

*Note.*—“Candidates who have passed only one part of the Intermediate Examination conducted by the University of Madras and are desirous of taking the Intermediate Examination of the Travancore University should appear for and pass the remaining parts at the same Examination. Candidates who have not passed in any part of the Intermediate Examination of the Madras University and are desirous of taking the Intermediate Examination of this University should pass all the three parts at the same examination.”

The provisions contained in this chapter shall be in force only till the examinations of March—April 1943.

## CHAPTER XXX.

DEGREE, DIPLOMA AND CERTIFICATE COURSES  
IN ENGINEERING.*B. Sc. Degree in Engineering.*

1. Candidates for admission to the Bachelor of Science (Engineering) Degree shall be required to have passed the Intermediate Examination of this University with Mathematics, Physics, and Chemistry

as optional subjects or any other examination recognised by the Syndicate as equivalent thereto and to have subsequently attended the College of Engineering, Trivandrum, for a period of not less than four academic years. They shall be further required to pass the examinations mentioned below, and to produce evidence which shall satisfy the Syndicate that they have spent not less than one year on approved practical training.

First Year.	First Examination in Engineering, Part I.
Second Year.	Do. Do. Part II.
Third Year.	B. Sc. Engineering Degree Examination Part I.
Fourth Year.	Do. Do. Part II

2. No candidate will be allowed to appear more than twice for any examination in Engineering, except the B. Sc Engineering Degree Examination, Part II.

3. All sessional work is valued and marks awarded. Three-tenths of the marks obtained by the candidate at the end of the First Year (*i. e.* examination marks plus marks for sessional work) are carried forward to the Second Year. Five-tenths of the marks obtained at the end of the second year are carried forward to the third year. Seven-tenths of the marks obtained at the end of the third year are carried forward to the fourth year. The whole of the four years' work will, in this way, ultimately count in the award of the Degree.

4. Candidates who obtain at each examination not less than 35 per cent. in each group of written papers, not less than 60 per cent. in the prescribed sessional work, and not less than 50 percent. of the grand total, *i. e.* examination marks plus marks for sessional work plus the carry-over from the previous year according to the proportions mentioned in Section 3, shall be declared to have passed the examination. All other candidates shall be deemed to have failed in the examination. Successful candidates who obtain not less than 60 per cent. of the grand total shall be placed in the second class and those who obtain not less than 70 per cent. of the grand total shall be placed in the first class. Successful candidates who obtain not less than 80 per cent. of the grand total at the end of the fourth year shall be declared to have passed B. Sc. Degree (Engineering) Examination with Honours.

#### *First Examination in Engineering, Part I.*

5. Candidates for the First Examination in Engineering, Part I, shall be required to have attended the College of Engineering, Trivandrum, for a period of not less than one academic year and shall be examined in the following subjects :—

Mathematics; Mechanics, Applied Physics, Engineering Chemistry;  
Building Materials and Construction, Surveying ; Practical  
Geometry, and Engineering] Drawing.

6. The Examination shall consist of 8 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A I.	Mathematics	One written paper of 3 hours	100
II.	Mechanics	do.	100
B I.	Applied Physics	do.	100
II.	Engineering Chemistry	do.	100
C I.	Building Materials and Construction	do.	100
II.	Surveying	do.	100
D I.	Practical Geometry	One written paper of 4 hours	100
II.	Engineering Drawing	do.	100
Total			800

Sessional work :—

Workshop Practice	100
Mechanics	50
Applied Physics	50
Engineering Chemistry	50
Surveying	50
Practical Geometry	50
Engineering Drawing	50
Conduct and Attendance	100
Total	500
Grand total	1,300

*First Examination in Engineering Part II.*

7. Candidates for the First Examination in Engineering, Part II, shall be required to have passed the First Examination in Engineering, Part I, and thereafter to have attended the College of Engineering, for a period of not less than one academic year. They shall be examined in the following subjects :—

Mathematics, Theory of Machines, Heat Engines, Electrical Technology, Strength of Materials, Building Materials and Construction, Surveying and Engineering Drawing.

8. The Examination shall consist of 8 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A I.	Mathematics	One written paper of 3 hours	100
II.	Theory of Machines	do.	100
B I.	Heat Engines	do.	100
II.	Electrical Technology	do.	100
C I.	Strength of Materials	do.	100
II.	Building Materials and Construction	do.	100
D I.	Surveying	do.	100
II.	Engineering Drawing—One written paper of 4 hours		100
Total.			800

## Sessional work :—

Workshop Practice	50
Heat Engines	50
Electrical Technology	50
Strength of Materials	50
Estimating	50
Surveying	50
Engineering Drawing	100
Conduct and Attendance	100
Total	<hr/> 500
Total for Second Year	1,300
Carried forward from First Year 3110 of 1,300	390
	<hr/> 1,690

*B. Sc. Degree (Engineering) Examination, Part I.*

9. Candidates for the B. Sc. Degree Examination in Engineering, Part I, shall be required to have passed the First Examination in Engineering Part II, and thereafter to have attended the College of Engineering, for a period of not less than one academic year. They shall be further required to have specialised in one of the branches, Civil, Mechanical or Electrical.

10. Candidates in the Civil Branch shall be examined in the following subjects :—

Mathematics ; Strength of Materials ; Hydraulics ; Heat Engines, Electrical Technology ; Docks and Harbours ; and Surveying.

11. The Examination shall consist of 7 written papers :

Group.	Subject.	Nature of Examination.	Marks.
A I.	Mathematics	One written paper of 3 hours	150
II.	Strength of Materials	do.	150
B I.	Hydraulics	do.	150
II.	Heat Engines	do.	150
III.	Electrical Technology	do.	150
C I.	Docks and Harbours	do.	150
II.	Surveying	do.	150
	Total		<hr/> 1,050

## Sessional work :

Strength of Materials	50
Heat Engines	50
Hydraulics	50
Electrical Technology	50

Geology and Minerology	50
Surveying	100
Estimating	50
Drawing	100
Conduct and Attendance	100
Total	<u>600</u>

Total marks for the Third Year	1 650
Carried over from the Second Year, 5/10 of 1,690	845
Grand total	<u>2,495</u>

12. Candidates in the Mechanical Branch shall be examined in the following subjects:—

Mathematics ; Strength of Materials ; Hydraulics ; Heat Engines  
Electrical Technology ; Theory of Machines ; Workshop,  
Appliances and Practice.

13. The Examination shall consist of 7 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A I.	Mathematics	One written paper of 3 hours.	150
II.	Strength of Materials	do.	150
B I.	Hydraulics	do.	150
II.	Heat Engines	do.	150
III.	Electrical Technology	do.	150
C I.	Theory of Machines	do.	150
II.	Workshop Appliances and Practice	do.	150
		Total	<u>1,050</u>

Sessional work :—

Strength of Materials	50
Heat Engines	50
Hydraulics	50
Electrical Technology	50
Workshop Practice	100
Engineering Drawing	200
Conduct and Attendance	100
Total	<u>600</u>

Total for the Third Year	1,650
Carried forward from Second Year, 5/10 of 1,690	845
Grand total	<u>2,495</u>

14. Candidates in the Electrical Branch shall be examined in the following subjects:—

Mathematics ; Strength of Materials ; Hydraulics ; Heat Engines ;  
Electrical Technology ; Electrical Machinery ; Electrical  
Measurements and Measuring Instruments.

15. The Examination shall consist of 7 written papers :

Group.	Subject.	Name of Examination.	Marks.
A I.	Mathematics	One written paper of 3 hours	150
II.	Strength of Materials	do.	150
B I.	Hydraulics	do.	150
II.	Heat Engines	do.	150
III.	Electrical Technology	do.	150
C I.	Electrical Machinery	do.	150
II.	Electrical Measurements and Measuring Instruments	do.	150
Total			<u>1,050</u>

Sessional work :—

Strength of Materials	50
Heat Engines	50
Hydraulics	50
Electrical Technology	50
Electrical Laboratory	100
Workshop Practice	100
Engineering Drawing	100
Conduct and Attendance	100
Total	<u>600</u>

Total marks for the Third year	1,650
Carried forward from Second year, 5/10 of 1,690	845
	<u>2,495</u>

## B. SC. DEGREE (ENGINEERING) EXAMINATION, PART II.

16. Candidates for the B. Sc. Degree (Engineering) Examination Part II, shall be required to have passed the B. Sc. Degree Examination (Engineering) Part I, and thereafter to have attended the College of Engineering for a period of not less than one academic year. They shall be further required to have specialised in one of the branches, Civil, Mechanical or Electrical.

17. Candidates in the Civil Branch shall be examined in the following subjects :—

Theory of Structures, Irrigation and Waterways ; Sanitary Engineering and Water Supply ; Roads, Railways and Bridges, Surveying, Engineering Economics and Accounts.

18. Examination shall consist of 7 written papers.

<i>Group.</i>	<i>Subject.</i>	<i>Nature of Examination.</i>		<i>Marks.</i>
A I.	Theory of Structures	One written paper of 3 hours		150
II.	Theory of Structures	do.	do.	150
B I	Irrigation and Waterways	do.	do.	150
II.	Sanitary Engineering and Water Supply	do.	do.	150
C I.	Roads, Railways and Bridges	do.	do.	150
II.	Surveying	do.	do.	150
III.	Engineering Economics and Accounts	do.	do.	150
Total				<u>1,050</u>

Sessional work :

Surveying	100
Civil Engineering Projects	200
Workshop Practice	100
Drawing	100
Conduct and Attendance	100
Total	<u>600</u>

Total Marks for the Fourth Year	1,650
Carried forward from the Third Year, 7/10 of 2,495	<u>1,747</u>
Grand total	<u>3,397</u>

19. Candidates in the Mechanical Branch shall be examined in the following subjects :—

Heat Engines ; Hydraulic Machinery ; Design of Power Plants ; Workshop Administration ; Electrical Generation and Distribution ; and Engineering Economics and Accounts,



20. Examination shall consist of 7 written papers :—

<i>Group.</i>	<i>Subject.</i>	<i>Nature of Examination.</i>	<i>Marks.</i>
A I.	Heat Engines	One written paper of 3 hours.	150
II.	Heat Engines		150
B I.	Hydraulic Machinery	do.	150
II.	Design of Power Plants	do.	150
C I.	Workshop Administration	do.	150
II.	Electrical Generation and Distribution	do.	150
III	Engineering Economics and Accounts	do.	150
Total			<u>1,050</u>

Sessional work :

Heat Engines and Hydraulic Laboratory

100

Mechanical Project

150

Drawing

150

Workshop Practice

100

Conduct and Attendance

100

Total

600

Total for the Fourth Year  
Carried forward from the  
Third Year, 7/10 of 2,495

1,650

1,747

Grand total

3,397

21. Candidates in the Electrical Branch shall be examined in the following subjects :—

Electrical Machinery ; Electrical Transmission ; Electrical Generation and Distribution ; Electrical Traction ; Electrical Communications ; Engineering Economics and Accounts.

22. Examination shall consist of 7 written papers :—

<i>Group.</i>	<i>Subject.</i>	<i>Nature of Examination.</i>	<i>Marks.</i>
A I.	Electrical Machinery	One written paper of 3 hours.	150
II.	Do.		150
B I.	Electrical Transmission	do.	150
II.	Electrical Generation and Distribution	do.	150
C I.	Electrical Traction	do.	150
II.	Electrical Communications	do.	150
III.	Engineering Economics and Accounts	do.	150
Total			<u>1,050</u>

## Sessional work :—

Electrical Laboratories	100
Electrical Project	200
Drawing	100
Workshop Practice	100
Conduct and Attendance	100
Total	600
Total for the Fourth Year	1,650
Carried forward from the Third Year, 7/10 of 2,495	1,747
Grand total	3,397

## DIPLOMA IN ENGINEERING.

23. Candidates for admission to the Diploma in Engineering shall be required to have passed the Travancore E. S. L. C. Examination and been declared eligible for admission to a course of study in this University or any other examination accepted by the Syndicate as equivalent thereto and to have subsequently attended the College of Engineering, Trivandrum, for a period of not less than 4 academic years. They shall be further required to pass the following examinations :

University Diploma Examination in Engineering, Part I,  
held at the end of the 2nd year.

University Diploma Examination in Engineering, Part II,  
held at the end of the 4th year.

24. The course is thoroughly practical, alternate periods being spent in the College and in the Workshop or on works.

25. For the first two years the course of study is the same for Civil, Mechanical and Electrical Engineering ; during the 3rd and 4th years candidates should be required to specialise in one of the branches.

26. No candidate will be allowed to appear more than twice for the University Examination Part I.

27. All sessional work is valued and marks awarded. Three-tenths of the marks obtained by the candidates at the end of the first year (*i. e.*, College Examination marks plus marks for sessional work) are carried forward to the second year. Five-tenths of the marks of the second year (*i. e.* University Examination marks plus marks for sessional work) are carried forward to the third year. Seven-tenths of the marks of the third year (*i. e.*, College Examination marks plus marks for sessional work) are carried forward to the fourth year. The whole of the four years, work will in this way ultimately count in the award of the Diploma.

## UNIVERSITY DIPLOMA EXAMINATION IN ENGINEERING, PART I.

28. Candidates for the University Diploma Examination in Engineering, Part I, shall be required to have attended the College of Engineering, Trivandrum, for a period of not less than two academic years and shall be examined in the following subjects:—

Mathematics; Strength of Materials; Heat Engines; Electrical Engineering; Hydraulics; Building Materials and Construction; Estimating; Surveying; Engineering Drawing,

29. The Examination shall consist of 9 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A. I.	Mathematics	One written paper of 3 hours	100
II.	Strength of Materials	do.	100
B. I.	Heat Engines	do.	100
II.	Electrical Engineering	do.	100
C. I.	Hydraulics	do.	100
II.	Building Materials and Construction	do.	100
D. I.	Estimating	do.	100
II.	Surveying	do.	100
III.	Engineering Drawing	do. 4 hours.	100
Total			900

## Sessional work :

Strength of Materials	...	50
Heat Engines	...	50
Electrical Engineering	...	50
Surveying	...	50
Hydraulics	...	50
Engineering	...	50
Conduct and Attendance	...	100
Workshop Practice	...	500

Total 900

Total for the Second Year	1,800
Carried forward from the First Year, 3/10 of 1,700	510
Grand total	2,310

30. Candidates for the University Diploma Examination in Engineering, Part II, shall be required to have passed the Diploma Examination in Engineering, Part I, and thereafter attended the College of Engineering, for a period of not less than two academic years.

31. Candidates in the Civil Branch shall be examined in the following subjects :—

Strength of Materials and Theory of Structures; Irrigation; Water Works and Sanitary Engineering, Roads; Bridges and Earthwork; Surveying; Reinforced Concrete and Steel Work.

32. The Examination shall consist of 6 written papers.

<i>Group.</i>	<i>Subject.</i>	<i>Nature of Examination.</i>		<i>Marks.</i>
A. I.	Strength of Materials and Theory of Structures	One written paper of 3 hours		150
II.	Irrigation	do.	do.	150
B I	Water Works and Sanitary Engineering	do.	do.	150
II.	Roads, Bridges and Earthwork	do.	do.	150
C. I.	Surveying	do.	do.	150
II.	Reinforced Concrete and Steel Work	do.	do.	150
Total				<u>900</u>

Sessional work :

Strength of Materials	100
Hydraulics	100
Surveying	100
Drawing	200
Workshop Practice	500
Conduct and Attendance	100

Total 1,100

Total marks for the Fourth Year 2,000

Carried forward from the Third Year, 7/10 of 2955 2,069

Grand total for the Fourth Year 4,069

33. Candidates in the Mechanical Branch shall be examined in the following subjects :—

Heat Engines; Strength of Materials and Theory of Structures; Theory of Machines; Hydraulics and Hydraulic Machinery; Machine design; Workshop Appliances and Practice.

34. Examination shall consist of 6 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A. I.	Heat Engines	One written paper of 3 hours.	150
II.	Strength of Materials and Theory of Structures	do.	150
B. I.	Theory of Machines	do.	150
II.	Hydraulics and Hydraulic Machinery	do.	150
C. I.	Machine Design	do.	150
II.	Workshop Appliances and Practice	do.	150
Total			900

Sessional work :

Strength of Materials	100
Heat Engine	100
Hydraulics	100
Drawing	200
Workshop Practice	500
Conduct and Attendance	100

Total ... 1,100

Total marks for the Fourth Year 2,000

Carried forward from 3rd year,  
7/10 of 2955 2,069

Grand total 4,069

35. Candidates in the Electrical Branch shall be examined in the following subjects :—

Electrical Machinery; Electrical Generation; Distribution and Transmission; Electrical Traction; Electrical Communications.

36. The examination shall consist of 6 written papers.

Group.	Subject.	Nature of Examination.	Marks.
A I.	Electrical Machinery,	One written paper of 3 hours.	150
II.	Electrical Machinery	do. do.	150
B. I.	Electrical Generation	do. do.	150
II.	Distribution and Transmission	do. do.	150
C. I.	Electrical Traction	do. do.	150
II.	Electrical Communications	do. do.	150

Total 900

## Sessional work :

Electrical Machinery	...	100
Electrical Testing	...	100
Electrical Projects	...	100
Drawing	...	200
Workshop Practice	...	500
Conduct and attendance	...	100
Total	...	<u>1,100</u>

Total for the Fourth Year 2,000

Carried forward from the Third Year,  
7/10 of 2955 2,069

Grand total ... 4,069

37. Candidates who obtain at the University Diploma Examination Part I, not less than 35 per cent. in each group of written papers, not less than 60 per cent. in the prescribed sessional work and not less than 50 per cent. of the grand total (Examination marks plus marks for sessional work plus the carry-over from the first year) according to proportions mentioned in section 5 shall be declared to have passed the examination. All other candidates shall be deemed to have failed in the examination.

Successful candidates who obtain not less than 60 per cent. of the grand total shall be placed in the Second Class and those who obtain not less than 70 per cent. shall be placed in the First Class.

38. Candidates who obtain at the University Diploma Examination in Engineering, Part II, not less than 35 per cent. in each group of written papers not less than 60 per cent. in the prescribed sessional work and not less than 50 per cent. of the grand total (*i. e.*, examination marks plus marks for sessional work plus the carry-over from the third year) according to the proportion mentioned in section (5) shall be declared to have passed the Examination. All other candidates shall be deemed to have failed in the examination.

Successful candidates who obtain not less than 60 per cent. of the grand total shall be placed in the Second Class and those who obtain not less than 70 per cent. shall be placed in the First Class. Successful candidates who obtain not less than 80 per cent. shall be declared to have passed the University Diploma Examination in Engineering with Distinction.

### *Certificate Course.*

The Certificate Courses in Engineering shall extend over a period of three academic years.

Admission to the Courses shall be open to persons who have completed the English Secondary School Leaving Course. (This may be waived in special cases).

The Course shall consist of the basic manual training required for the various Engineering trades followed by more advanced instruction in one of them, thus preparing the candidates for employment in one of the three branches of Engineering, Civil, Mechanical or Electrical.

Marks will be awarded for throughout the course, and examinations will be conducted by means of written papers and practical tests.

Candidates who obtain fifty per cent. of the total marks (examination plus course work) will be eligible for the Certificates. Those obtaining over 75 per cent. of the total marks will be granted a Certificate with Distinction.

## CHAPTER XXXI.

### **Diploma in Forestry**

1. Candidates for admission to the Diploma Course in Forestry shall be required to have passed the Intermediate Examination of this University with Biology, Physics and Chemistry or any other examination recognised by the Syndicate as equivalent thereto. They shall undergo a preliminary practical training in the forests of Travancore for about six months and shall thereafter undergo the prescribed course in Forestry and cognate subjects for a period of two academic years.

2. The course shall include theoretical and practical training in the following groups of subjects :—

- (1) Silviculture and Forest Utilisation.
- (2) Range Administration, Law and Forest management.
- (3) Engineering, Surveying and Drawing.
- (4) Botany, Mycology and Forest Entomology.
- (5) Physical Science, First Aid and Hygiene, Drill and Physical Training.

3. There shall be College Examinations in the First and Second years and a University Examination at the end of the course.

The scheme of the various examinations shall be as follows :—

I. FIRST YEAR—COLLEGE EXAMINATION.

Group.	Subjects.	Tour			Total.
		Written.	Practical.	Journal.	
I.	Silviculture	... 75	50	25	150
	Forest Utilisation	... 75	50	25	150
II.	Range Administration and Law	... 100	...	...	100
	Forest Management	... ..	...	...	...
III.	Engineering, Surveying and Drawing	... 100	50	50	200
	Surveying and Drawing	... 100	50	50	200
IV.	Botany, and Mycology	... 100	50	...	150
	Forest Entomology	... ..	...	...	...
V.	Physical Science	... 100	50	...	150
	First Aid and Hygiene	... 50	50	...	100
	Drill and Physical Training	... ..	...	...	...
Total		... 700	350	150	1200

II. SECOND YEAR—COLLEGE EXAMINATION.

Group.	Subject.	Periodical Examination.			Total.
		Written.	Practical.	Tour Journal.	
I.	Silviculture	60	40	50	150
	Forest Utilisation	... 40	20	40	100
II.	Range Administration and Law	... 60	40	...	100
	Forest Management	... 60	40	...	100
III.	Engineering	... 40	...	40	80
	Surveying and Drawing	... 40	...	40	80
IV.	Botany and Mycology	... 60	20	...	80
	Forest and Entomology	... 40	20	...	60
V.	Physical Science	... ..	...	...	...
	First Aid and Hygiene	... ..	...	...	...
	Drill and Physical Training	... ..	50	...	50
Total		... 440	190	170	800



## III. FINAL—UNIVERSITY EXAMINATION—

Group.	Subjects.	Theory.		Practical.	Total.	Half of 1st Year's marks carried forward.	Half of 2nd Year's marks carried forward.	Grand Total
		Duration.	Marks.					
I	Silviculture .	3	90	60	150	75	75	300
	Forest Utilisation .	2	60	40	100	75	50	225
II	Range Administration and Law .	3	90+60	..	150	50	50	250
	Forest Management .	3	90	60	150	...	50	200
III	Engineering .	3	60	60	120	100	40	260
	Surveying and Drawing .	3	60	60	120	100	40	260
IV	Botany and Mycology .	3	90	60	150	75	40	265
	Forest Entomology .	2	60	...	60	...	30	90
V	Physical Science .	..	..	..	...	75	..	75
	First Aid and Hygiene .	..	..	...	...	50	..	50
	Drill and Physical Training .	..	..	..	...	..	25	25
	Total .	..	660	340	1000	600	400	2000

4. Half of the aggregate marks obtained by each candidate during the first year and half of the marks for the periodical examination of the second year will be added to the marks obtained by him in the University Examination.

5. Candidates who obtain not less than 35 per cent. of the aggregate for each group and not less than 40 per cent. of the grand total shall be declared eligible for the Diploma in Forestry.

6. Successful candidates who obtain not less than 60 per cent. of the grand total shall be declared to have passed the examination with Honours.

## RULES.

## THE TRAVANCORE UNIVERSITY UNION.

## 1. Name

The Union shall be called "THE TRAVANCORE UNIVERSITY UNION."

## 2. Object.

(i) The object of the Union shall be to promote corporate, social and cultural life of the students of the University.

(ii) The Union may undertake any or all of the following activities :—

- (a) provide for its members the usual amenities of a club,
- (b) hold debates and arrange for lectures of general interest,
- (c) give entertainments,
- (d) organise indoor games,
- (e) maintain a Reading Room and Library,
- (f) conduct a Students' Magazine, a Restaurant and a Co-operative Stores, and
- (g) organise centres for social service.

## 3. Membership.

(i) Membership shall be of three kinds :—

- (a) Ordinary,
- (b) Life, and
- (c) Honorary.

(ii) Ordinary Members.

(1) Any student on the rolls of an institution of the University who pays a subscription of Bh. Rs. 2 per annum. The annual subscription shall be payable in advance.

(2) Any teacher of the University who pays a subscription of Bh. Re. 1 per term. Such members shall not hold any office except that of Honorary Treasurer and shall not be entitled to vote at elections.

(iii) Life Members :—

(1) Any member who is an ordinary member continuously for four years.

(2) Any member who pays, in one lump a sum equal to the subscription for 15 terms, provided that at the time of such payment a deduction shall be made equal in amount to the subscription paid previously without break.

(3) Life members shall not hold any office except that of Honorary Treasurer and shall not be entitled to vote at elections unless they are, at the time, on the rolls of an institution of the University.

(iv) **Honorary Members: —**

(1) Persons of public eminence may, from time to time, be elected as Honorary Members at a general business meeting on the recommendation of the Patron made in consultation with the Executive Committee,

(2) Honorary members shall not hold any office and shall not be entitled to vote at elections.

**4. Officers.**(i) **The following shall be the Officers of the Union:—**

(1) The Patron.

(2) The Vice-Patron.

(3) The President.

(4) The Vice-President.

(5) The Secretary.

(6) The Honorary Treasurer.

(7) The Conveners of the Standing Committees, if any, of the Executive Committee.

(8) Members of the Executive Committee.

(ii) **The Patron.**

(1) The Vice-Chancellor of the University shall be the *Ex-officio* Patron

(2) The Patron shall be the ultimate authority in all matters concerning the Union.

(3) The Patron may give rulings as regards the interpretation of these Rules and Standing Orders, if any, and regarding matters not otherwise provided for. These rulings shall be recorded in a register maintained for the purpose and shall be in force till cancelled by the Patron.

(4) The Patron may delegate, in writing, any or all of his powers to the Vice-Patron.

(5) The Patron may form an Advisory Committee consisting of any or all the Principals of the institutions in the University, and the Honorary Treasurer.

(iii) **The Vice-Patron:—**

(1) The Pro-Vice-Chancellor of the University, if any, shall be the Vice-Patron.

(2) He shall exercise such powers as are delegated to him by the Patron.

(iv) **The President:—**

(1) The President shall be elected from and by members of the Union who are qualified to vote at elections provided that the candidate for this office must have been a member of the Union for one term.

(2) The President shall be elected during the third term of an academic year and shall hold office during the succeeding year.

(3) The President shall preside at all meetings of the Union and of the Executive Committee, provided that at meetings at which

only lectures are delivered, he may request any teacher of the University or, with the permission of the Patron, some other person to preside.

(4) He shall maintain order at the meetings and conduct the business of the Union according to the Rules, Standing Orders and rulings of the Patron.

(5) He shall decide on points of order and his decision shall be final so far as the meeting is concerned, provided, however, that he shall be guided by and shall carry out any rulings given by the Patron.

(6) If the President desires to speak on a motion at a general meeting of the Union, he shall vacate the chair temporarily, when the duty of President shall devolve upon some other member as provided for in these Rules.

(7) The President may request any teacher of the University or, with the permission of the Patron, some other person to act as Observer.

(8) A member may not be re-elected as President.

(9) The President shall hand over charge to the Honorary Treasurer, if he leaves the institution where he is enrolled or vacates his office by resignation.

(v) The Vice-President—

(1) The Vice-President shall be elected from and by members of the Union who are qualified to vote at elections, provided that the candidate for this office must have been a member of the Union for one term.

(2) The Vice-President shall be elected during the third term of an academic year and shall hold office during the succeeding year.

(3) The Vice-President shall carry out the duties of the President when the President is absent or elects to speak on a motion at a general meeting of the Union.

(4) The Vice-President shall hand over charge to the Honorary Treasurer, if he leaves the institution where he is enrolled or vacates his office by resignation.

(vi) The Secretary —

(1) The Secretary shall be elected from and by members of the Union who are qualified to vote at elections, provided that the candidates for this office must have been a member of the Union for one term.

(2) The Secretary shall be elected during the first term of an academic year and shall hold office during that year.

(3) The duties of the Secretary shall be—

(a) to issue notice for and to attend all meetings of the Union and of the Executive Committee,

- (b) to keep the minutes of the business meeting and to present them for confirmation at the next meeting and to keep records of the proceedings of all debates and meetings of the Union and of all meetings and debates held under the auspices of the union;
  - (c) to sign on behalf of the Union all documents except drafts or cheques which will be issued only by the Honorary Treasurer;
  - (d) to conduct all the correspondence of the Union except that with the University ;
  - (e) to keep all the records of the Union, other than those kept by the Honorary Treasurer and Librarian, if any;
  - (f) to prepare the annual report;
  - (g) to supervise the work of the office;
  - (h) to arrange for the purchase of the requisites for the Union
  - (i) to incur expenditure on contingencies up to a limit of Bh. Rs. 10 in the case of each item and to perform any duties which may be specially entrusted to him by the Executive Committee, and
  - (j) generally, except in cases otherwise provided for, to conduct the affairs of the Union.
- (4) When the Secretary finds it necessary temporarily to vacate his place either because he wants to take part in the debate himself, or for any other reason, the Chairman may call upon some student member of the Executive Committee to take the Secretary's place.
- (5) A member may not be re-elected as Secretary.
- (vi) The Honorary Treasurer :—
- (1) The Honorary Treasurer shall be appointed by the Patron and shall hold office for such period as the Patron shall decide.
  - (2) The Honorary Treasurer shall be ex-officio Secretary of the Advisory Committee, if any.
  - (3) The Honorary Treasurer shall be in charge of the funds of the Union. He shall be responsible for receipts and expenditure and shall see that expenditure is incurred, within the limits of the Budget, according to appropriate sanctions.
  - (4) All purchases exceeding Bh. Rs. 10 at a time shall be made by the Honorary Treasurer.
  - (5) The Honorary Treasurer shall make all disbursements on proper vouchers.
  - (6) He shall prepare the annual Budget, present it to the Executive Committee for consideration and submit it to the Patron for approval together with any resolutions that the Executive Committee may pass and his recommendations thereon.
  - (7) The Honorary Treasurer shall not be entitled to vote on any question that is being discussed by the Executive Committee or Sub-Committees.

(8) The Honorary Treasurer shall have the powers to appoint or dismiss or punish any member of the clerical or menial staff at his discretion and he shall report the matter forthwith to the University. He shall have final administrative control of the office and the servants of the Union but he shall allow the various Office-bearers of the Union to make use of the Office and servants for work connected with their duties.

(9) A copy of the proceedings of all meetings of the Executive Committee and its Sub-Committees and of the general body shall be furnished forthwith by the Secretary or the Convener, as the case may be, to the Honorary Treasurer, who may declare any decision as contrary to rules, in which case he shall give an intimation to the officer concerned and place the matter forthwith before the Patron for final decision.

(10) Whenever an officer vacates his office by resignation, withdrawal from the University or any other cause, he shall hand over the charge of his office to the Honorary Treasurer who shall transfer it to the successor when appointed.

(11) It shall be the duty of the Honorary Treasurer to see that all elections are held expeditiously and that vacancies among officers are filled up promptly according to the rules.

(viii) Conveners of Sub-Committees :—

(1) Conveners of Sub-Committees shall be elected by the Executive Committee and shall perform the duties of President and Secretary with regard to their Sub-Committees provided that these officers are not members, or, being members, delegate their duties to the Conveners.

(2) The President, Secretary and Honorary Treasurer may attend any meeting of a Sub-Committee. They shall not, however, exercise any right of voting at these meetings unless they are members of the Sub-Committee.

(ix) The Executive Committee :—

(1) The Executive Committee of the Union shall consist of the following members :—

(a) The President.

(b) The Vice-President.

(c) The Secretary.

(d) The Honorary Treasurer.

(e) One member elected by the members of the Union entitled to vote at elections, from among members undergoing a course of study in each Faculty, provided that there are at least ten such members.

(f) One additional member for every 100 members entitled to vote,

(2) Members of the Executive committee under Sub-Sections (e) and (f) above shall be elected at the commencement of an academic year and shall hold office during the year in which they are elected.

(3) The Executive Committee shall manage the affairs of the Union and shall have power, subject to the provisions of the rules, to do all such acts as may be necessary to carry into effect the objects of the Union.

(4) The Executive Committee may, from among its members, appoint standing Sub-Committees for any purpose (e. g., Refreshment, indoor games etc.).

(5) The Executive Committee may, from among its members, appoint *ad hoc* Sub-Committees for specific purposes.

(6) The Executive Committee with the approval of the Patron, and Sub-Committees with the approval of the President may co-opt any from among the ordinary members of the Union for a specific purpose. Co-opted members shall not exercise the right to vote and shall be present at the meeting of the Executive Committee or the Sub-Committee, as the case may be, when matters relating to the specific purpose are being discussed.

(7) The Executive Committee shall meet in the Union rooms at least once every two weeks during term time and notice of such meetings shall be posted on the notice board of the Union together with the agenda.

(8) Ordinarily, no matter not notified in the agenda shall be considered except urgent business brought forward by the Honorary Treasurer. The President may however allow, in cases of urgency a matter to be raised by any other member but any resolution that may be passed must receive the support of an absolute majority of all the members of the Committee before it is acted upon.

(9) The quorum for a meeting of the Executive Committee shall be 5 or half the number of members, whichever is less.

(10) Decisions shall be taken in accordance with the opinion of the majority of the members present. The Chairman shall have a casting vote in addition to his vote as a member.

(11) The Executive Committee may frame Standing orders not repugnant to these Rules and to rulings given by the Patron. Such Standing orders shall come into force only after they have received the assent of the Patron.

(12) (a) The Executive Committee can dismiss any officer elected by itself, by the vote of an absolute majority of its members.

(b) If the Executive Committee passes, by an absolute majority of its members, a vote of no confidence in any officer elected by the

general body, the matter shall be referred to the Patron who may take action upon such a resolution himself or refer it to the general body, if he desires.

(c) Resolution referred to in (a) and (b) above shall be passed only after notice of such a resolution is given to all the members at least one week beforehand.

(13) A member of the Executive Committee who does not attend any of its meetings during one term shall cease to be a member unless a meeting consisting of a quorum of the other members of the committee decide otherwise, and the Patron approves of the decision.

#### 5. Votes of no Confidence.

(i) A vote of no confidence may be passed in a business meeting of the Union on any officer on a motion of the Executive Committee referred to the general body by the Patron or resolution sponsored by fifty members, or by one-third the total number of members, whichever is less.

(ii) Notice of such motions shall be posted on the notice board at least one week before the meeting.

(iii) The vote shall be carried only if  $\frac{2}{3}$  of the members present are in favour and the special quorum provided for hereafter, is present.

#### 6. Auditor.

One or more auditors shall be nominated annually by the Patron to audit the annual accounts. The audit report shall be placed before a general business meeting of the Union during the first term.

#### 7. Registers.

(1) The following registers shall be kept : —

- (a) register of members,
- (b) a stock-book of the Union's movable property.
- (c) a cash book,
- (d) a register of purchases,
- (e) ledger of receipts and expenditure,
- (f) register of rulings by the Patron.
- (g) a minutes book of the meetings of the Executive Committee and of the Union,
- (h) a minutes book of the business meetings of the general body,
- (i) a minutes book of the ordinary meetings of the general body.
- (j) a Roll of Honour containing the names of winners of prizes awarded by the Union.
- (k) a succession list of officers of the Union.
- (l) any other book or register prescribed by the Executive Committee or Patron.



(ii) Registers (a), (b), (c), (d), (e), and (f) shall be in the custody of the Honorary Treasurer, registers (g), (h), (i), (j), and (k) in the custody of the Secretary and register (l) in the custody of the officer nominated for the purpose by the Executive Committee or the Patron, as the case may be.

(iii) The Patron may authorise any person to inspect the registers of the Union and take any action that he considers necessary on the report made by the inspector.

(iv) The Honorary Treasurer shall have access to all the records of the Union.

#### *Meetings.*

(1) Meetings of the General body of the Union shall be of two kinds :—

(i) business meetings.

(ii) meetings for debates and for lectures.

#### *Business Meetings.*

(1) Business meetings will deal with the affairs of the Union itself and notice of such meetings together with the agenda, shall be posted on the Union notice board at least a week beforehand. The notice may also contain a statement of the resolutions to be proposed at such meetings, of which due notice has been given.

(2) There shall be at least one business meeting for each term.

(3) The business shall be taken in the following order:—

(a) the proceedings of the preceding business meeting shall be read and confirmed, and signed by the Chairman,

(b) notice of motions shall be read,

(c) questions to officers, and supplementary questions,

(d) discussions on resolutions.

(4) No non-member shall be allowed to be present.

(5) (a) Questions relating to the affairs of the Union may be asked, when previous notice of such questions has been given. All questions of which notice has been given shall be submitted to the Vice-Patron whose decision shall be final regarding their admissibility.

(b) Not less than 24 hours' notice must be given to the officer concerned.

(c) Questions shall be posted on the notice board before 11 A. M. on the day of the meeting.

(d) Questions shall not occupy more than 15 minutes.

(e) The Chairman shall have power to rule out any supplementary question as frivolous or out of order without being required to assign reasons.

(iii) *Annual General Meeting.*

(1) One business meeting of the Union, called the Annual General Meeting, shall be held in the 3rd term after the results of the election of President and Vice-President have been announced.

(2) The business at this meeting shall be—

(a) to consider the financial statement of the Honorary Treasurer ;

(b) to consider the budget together with cut motions, if any;

(c) to transact any other business relating to the affairs of the Union of which due notice has been given ;

(d) to instal the President and the Vice-President for the succeeding year.

(3) An abstract of the budget as finally approved by the Patron shall be posted on the notice board at least one week before the date of the Annual General Meeting.

(4) Members may give notice, at least three days earlier, of token motions for a cut in any allotment with a view to discuss matters connected with the object of the allotment.

(iv) Fifty members or one third the total number of ordinary members, whichever is less, shall form a quorum for a business meeting, provided that at any meeting which is to consider recommendations regarding changes in the rule or a resolution of no confidence in any officer, the quorum shall be 100 members or half the total number of ordinary members, whichever is less.

(v) *Meetings for Debate and for Lectures.*

(1) The business of a meeting for debate shall be conducted in the following order—

(a) debate including voting on the resolution, and

(b) remarks of the observer, if any.

(2) (a) The subject for debate shall be chosen by the Executive Committee and shall be in the form of a resolution ;

(b) The subject of a debate for any meeting must be placed on the Union's notice-board at least seven days before the day of the meeting.

(c) The Executive Committee may, with the consent of the Patron, invite non-members to speak at a debate of the Union.

(3) At meetings for lectures, the order of business shall be—

- (a) Introduction of the lecturer by the Chairman,
- (b) Lecture,
- (c) Questions on the speech of the lecture, if permitted,
- (d) Chairman's remarks, and
- (e) Vote of thanks.

(4) At meetings for debates and for lectures non-members may be allowed to be present.

(5) The President may invite a teacher of the University to act as Observer in any meeting at which a debate is held. The observer shall not address the meeting till after the votes have been taken.

(iv) At meetings of the Union—

- (a) theological questions shall not be discussed, nor arguments of a theological nature introduced in debate ;
- (b) no personal or offensive remarks shall be made ;
- (c) acts of the Patron shall not be called into question ;
- (d) the Chairman may call upon any member to explain any expression used by him. If the explanation is not satisfactory the President may call upon the member in question to withdraw or apologise ; and
- (e) the Chairman may call upon any member to withdraw a remark or apologise for disorderly behaviour or offensive conduct. In case a member does not withdraw or apologise for his unruly conduct when called upon to do so, the Chairman may order the member concerned to leave the meeting. Failure to do so must be reported forthwith to the Patron and the Executive Committee may make any recommendation on the matter.

(iii) The conduct of business at all meetings of the Union shall be regulated, unless otherwise provided for, in accordance with the Statutes governing meetings of the Senate in so far as they are applicable.

## 9. Directions.

Tr (i) The general elections shall be conducted by the Honorary Treasurer, who shall be the Returning Officer, and, in his absence, by some teacher appointed by the Patron.

Office (ii) Nomination papers shall be handed over to the Returning Officer before the time and date prescribed and notified and a receipt

obtained for such delivery. Each nomination paper shall be accompanied by a deposit of Bh. Rs. 3 which will be forfeited if the candidate withdraws from the contest or fails to secure at least  $\frac{1}{3}$  'N' th of the total number of valid votes where 'N' represents the number of candidates.

(iii) Each nomination paper shall be for one office or place only.

(iv) Each nomination paper shall contain the name of the proposed candidate (with his class in the University), the office for which he is nominated, his consent to such nomination, and the names (with their classes) and the signatures of the proposer and seconder of such nomination.

(v) The Returning Officer shall verify all the facts mentioned in the nomination paper and shall record on it the date of receipt.

(vi) A scrutiny will be held of all nomination papers by the Returning Officer at the time notified. Candidates and their proposers and seconders may be present at the scrutiny.

(vii) If the returning Officer considers a nomination paper irregular or invalid he shall bring the matter to the notice of the Patron whose decision as to its validity will be final.

(viii) No member of the Union shall propose or second more names than there are vacancies for the particular post or posts. If any member has proposed or seconded more candidates than there are vacancies, all the nomination papers to which he has appended his signature will be declared invalid.

(ix) The Returning Officer shall post on the notice board of the Union the list of all candidates proposed for various offices together with the names of the proposer and seconder in the following forms :—

Office.	Name of candidate. (with class.)	Name of Proposer (with class)	Name of Seconder (with class.)	Declaration of the Returning Officer whether the nomination is valid.

(x) The polling will be held by means of ballot papers. Due arrangements for polling shall be made by the Returning Officer so that the secrecy of the ballot shall be kept.

(xi) (a) There shall be different ballot papers for the elections to the offices of (1) the President (2) the Vice-President, (3) the Secretary, (4) the members of the Executive Committee, and (5) any other office which may hereafter be created.

(b) The form of the ballot papers shall be decided by the Patron.

(xii) Ballot papers will be serially numbered on the counter-foil and the voter shall sign his name on the counter foil. The vote will be invalid if the voting paper is signed or bears any mark for identification.

(xiii) The Returning Officer may arrange several polling booths if necessary to enable all voters to vote conveniently and may distribute the names on the electoral roll between these booths, indicating clearly outside the booths the groups of voters who are to vote there.

(xiv) Each polling booth will be in charge of a polling officer who will be provided with a list of the voters who are required to vote there. He shall require the voter to sign his name on the counter-foil of the ballot paper.

(xv) The Returning Officer shall exercise general supervision over all the booths and he may, if necessary, nominate polling officers and other persons to help him in his work as Returning Officer.

(xvi) The Returning Officer shall fix the hours during which voting shall take place and no voter who has not received a ballot paper before the close of the time appointed shall be allowed to vote.

(xvii) Every voter shall go to the place for recording his vote immediately on being given the ballot paper, and he shall deposit the paper in the box after recording his vote. The paper must be deposited even if the voter does not desire to record his vote for any candidate. No voting paper shall be taken away from the polling booth.

(xviii) After the close of the poll, the Returning Officer shall seal each box with his seal; any of the candidates may also affix their seals to the box in addition if they like.

(xix) The Returning Officer shall take these boxes into his custody and shall be responsible for their safety.

(xx) The Returning Officer shall announce on the day after the poll the time and the place at which the counting of the votes shall take place. The counting shall be finished within two days of the poll.

(xxi) The Returning Officer shall count the votes in the presence of any of the candidates who may wish to be present; and he may appoint a certain number of persons to help him in the counting.

(xxii) While counting votes the Returning Officer will decide the validity of each vote and in case of doubt his decision shall be final.

(xxiii) The result of the count will be immediately communicated to the Patron, who will announce the result after allowing twenty-four hours for any complaint.

(xxiv) (a) Any complaints against the proper counting of votes must be made to the Patron within twenty-four hours of the conclusion of count. Such complaint shall be accompanied by a deposit of Bh. Rs. 5 which will not be returnable.

(b) If any complaint is made about the count the Patron will investigate the matter either personally or through some person appointed by him. The Patron's decision on the matter will be final.

(xxv) The boxes of voting papers will again be sealed after the conclusion of the count and will be in charge of the Returning Officer till the Patron has announced the result of the election after which the voting papers will be destroyed according to the directions of the Patron.

(xxvi) Within a week after the confirmation of elections by the Patron, each candidate will forward a return of his expenses in connection with the election to the Returning Officer which will be posted on the notice board of the Union. Any candidate who fails to submit the return may, if he has been elected, be liable to have his election declared invalid.

(xxvii) (1) The President, Vice-President and the Secretary will be elected, if possible, by absolute majority on the basis of a single transferable vote.

(2) The names of all the candidates will be arranged on the ballot paper in alphabetical order and the voters may affix different numbers against each candidate in the order of their choice.

(3) If on the first count, no candidate secures a clear majority the candidate securing the least number of first votes will be eliminated and the votes cast for him redistributed according to the second choice.

(4) This procedure will be repeated till one candidate obtains an absolute majority or till only two candidates are left, when the candidate who has the larger number of votes shall be declared elected.

(xxviii) The members of the Executive Committee will be elected by the system of proportional representation with a single transferable vote as in the case of elections to the Senate by the Registered Graduates, provided that representation provided for in Rules 4, (ix) (e) shall be secured.

(xxix) In the case of a casual vacancy in the office of the President, the Vice-President or the Secretary, or elective membership of the Executive Committee, occurring more than one month before the expiry of their term of office, a bye-election will be held according to the election rules. In case the vacancy occurs within one month of the above period, the Executive Committee shall fill up the vacancy, subject to the approval of the Patron. Any person so elected or appointed shall hold office only for the remaining portion of the tenure of the retiring person.

(xxx) All election results shall be subject to confirmation by the Patron.

#### 10. Rules.

(i) In matters not provided for in these rules or in the Standing Orders, the Patron shall have power to take such action as he considers necessary.

(ii) Changes in these rules can be made only by the Syndicate of the University.

(iii) Recommendations for changes may be made by the Union to the Patron for consideration and such action as he thinks proper.

(iv) No recommendation for a change can be made except by a resolution passed by a three-fourth majority at a business meeting of the Union. The quorum for this purpose shall be 100 or half the total number of members, whichever is less.

(v) Such resolutions can be brought forward—

(1) by the Executive Committee

or (2) by 50 members of the Union or one-third of the total number of members, whichever is less.

In the latter case the resolution shall first be considered by the Executive Committee and placed before a business meeting together with the opinion of the Executive Committee.

#### II. Transitory Provisions.

(i) Notwithstanding anything contained in these Rules, the first President, Vice-President, Secretary and members of the Executive Committee shall be nominated by the Patron.

(ii) The Patron shall have power to frame the first budget.

#### II. THE UNIVERSITY STUDENTS' HALL.

Under the management of the University Board of Physical Education, the University is arranging for a separate Hostel "The Students' Hall" in the Barracks Building opposite the University Playgrounds. Situated in healthy surroundings and in almost a Central place within easy reach of all the Colleges of the University, it is intended to provide decent board and lodging facilities for students who can not afford high rates of living.

## Rules.

### 1. Admission.

(a) Admission is confined to male students of all University Colleges at Trivandrum.

(b) Application for admission should be forwarded to the Secretary, Board of Physical Education through the Principals of the Colleges concerned. They should be made in the form appended to these Rules copies of which may be had at the respective Colleges. Applications not in the prescribed form are liable to be rejected.

### 2. Privileges.

(a) Each member will on admission be allotted convenient accommodation in the Hall, which will consist of a common sleeping room, dining room, study room and strong room. He should provide himself with his own bedding and box or trunk to lock things in. He can bring in other articles only with the permission of the Resident Proctor. The inmates can keep their boxes and other valuables in the strong room which will be kept ordinarily open every morning between 7 and 8 A. M. At other times the inmates can, if absolutely necessary, request the Resident Proctor to have the room opened for them.

(b) Members of the Hall are entitled to free medical advice.

### 3. Discipline.

1. The Resident Proctor is in *loco parenti* to members of the Hall.

2. The members are expected to spend within the Hall premises most of their time outside the College hours.

3. The members should behave with restraint and decorum. Shouting, reading aloud and such other acts likely to disturb others should be avoided at all times.

4. Members should sleep on cots assigned to them in the common sleeping room.

5. Each member is personally responsible for keeping the Hall, person and things neat and tidy.

6. The lights of the Hall should not be kept burning between 10-30 P. M. and 4-30 A. M. and only lights absolutely necessary should be allowed to burn at other hours of the night.

7. Members who are ill should report immediately to the Resident Proctor with a view to get medical advice. They should not seek medical aid directly from the medical officers.

8. Applications from members for permission to be absent from College shall in the first instance be made in writing sufficiently early to the Resident Proctor and the leave chits will be forwarded to the Principals concerned.



9. Members are not allowed to remove any article of furniture, bulb or other electric fitting etc., that belong to the Hall. All damages done to the Hall properties (including things lent for their use) by the members will have to be made good by the members. Mischievous damage naturally entails a penalty being determined by the Secretary, Board of Physical Education.

10. Members should have no dealings with the menial servants of the Hall. In exceptional circumstances they may apply to the Resident Proctor for the temporary loan of the services of a servant.

11. Any member reported for misconduct from his College is liable to suspension or dismissal from the Hall.

12. No inmate will be allowed to leave the Hall after 8-45 P. M. except with the permission of the Resident Proctor. The Roll call at which every member must be present shall be made at 9 P. M. Members who for any reason fail to attend the Roll call must explain to the Resident Proctor the reason for their absence.

13. Members infringing any of the rules are liable to be fined and in extreme cases of misbehaviour, suspended or dismissed from the Hall and the matter will be reported to the Colleges concerned.

14. No member of the Hall shall take active part in any political meetings, processions or propaganda. Disregard of this rule will lead to immediate expulsion from the Hall.

#### 4. *Mess.*

(a) There will be only one Mess (a vegetarian mess). Mess arrangements will be in accordance with the previous sanction from the Secretary, Board of Physical Education obtained by the Resident Proctor.

(b) No member of the Hall except the Resident Proctor shall enter the kitchen.

#### 5. *Guests.*

1. The permission of the Resident Proctor shall be obtained for introducing any guest for boarding. A member who leaves the Hall as per clauses V (b) and (c) under "Payments" shall not ordinarily be allowed to be in the Hall as a guest.

2. Except with the permission of the Resident Proctor no person other than a member of the Hall will be allowed to sleep in the Hall. The admission of guests for boarding or lodging will be regulated by the rules framed for the purpose by the Resident Proctor.

#### 6. *Payments.*

(a) (i) Members shall on admission pay a deposit of B. Rs. (12) twelve returnable after deducting arrears, if any, only at the time of their actually leaving the Hall.

- (ii) The boarding charges will be B. Rs. 7 per mensem per head excluding Re. 1 for electricity and water charges.
- (iii) The boarding fee for the month should be paid on or before the 10th of the succeeding month.

(b) A defaulter will be allowed to remain in the Hall for a further period of 5 days on condition of paying his dues together with a fine of four chuckrams. If the dues and fine be not paid by that date he shall leave the Hall by the morning of the sixteenth day. During the months of the closing and opening of the Hall, the dates of payment will be announced by the Secretary, Board of Physical Education, on the Hall notice board

(c) Any member who forfeits his membership in the Hall owing to the failure to pay his dues by the dates mentioned above may on the recommendation of the Resident Proctor and with the approval of the President of the Board of Physical Education be readmitted on payment of his dues and fine only if he applies for readmission before the end of the month, failing which his deposit money will be drawn upon for payment of his arrears and fine and his account will be closed.

(d) No rent will be levied from the inmates for their accommodation provided in the Hall.

### *7. Reading and In-door Games.*

Arrangements will be made to provide a reading room in the Hall as also facilities for in-door games.

### *8. Miscellaneous.*

1. The Secretary, Board of Physical Education, has powers of supervision, to regulate internal matters and other details not explicitly covered by these rules.

2. A member wishing to leave the Hall in the middle of an academic year should obtain the permission of the Secretary, Board of Physical Education for doing so. Those who leave the Hall during the course of a month and wish to have their deposits returned to them, shall have to pay for their mess expenses at a fixed rate of Rs. 12 per mensem for the days they actually messed in the Hall. If, however, they are willing to take back their deposits at the close of the month, i. e., on the 5th of the succeeding month they will have to pay only at the rate of B. Rs. 8 per mensem for the days they messed in the Hall.

3. On all days on which the Hall is working, money may be paid or received at the Hall Counter between 3-30 and 4 P. M. except on the re-opening day when money will be received between 8 and 9 A. M. and 3-30 and 4 P. M. Any change of these hours will be put on the Hall notice board.

4. No food will be served after 9 A. M. (breakfast), 1-30 P. M. (lunch) and after 7-30 P. M. (supper) except with the permission of the Resident Proctor.

### III. ACCOUNT RULES.

1. The University shall have a fund styled "The Travancore University Fund" to which shall be credited :

- (i) Income from fees, interest received, etc.
- (ii) Grants from Government.
- (iii) All miscellaneous receipts of the University.
- (iv) Endowments, donations, etc.

2. The fund account of the University shall be with the State Treasuries.

3. All moneys received on account of the University should be remitted to the nearest Treasury for credit to the head "The Travancore University Fund."

Amount which may be received at any bank by special arrangements shall be arranged to be credited to the University Fund Account by the Account Officer.

4. The annual grants from the Government shall be adjusted to the credit of the University Fund by the Account Officer.

5. Receipts of any kind received in any institution shall not be utilised directly for expenditure of any kind on any account. They should be immediately remitted to the Treasury.

6. Remittances to the Treasuries shall be accompanied by triplicate Chalans. The Chalans will contain details regarding the detailed heads under which the amounts have to be credited in the University accounts, even though the amount is only credited under the University Fund account in the Treasuries.

7. The Divisional Treasury Officers shall forward daily to the Officer in charge of the University Account and Audit Section, a detailed statement of receipts and disbursements with the triplicate Chalans in support of receipts, and cheques cashed in support of payments.

8. The Chalans will be classified in the Audit Section of the University daily and a consolidated account of receipts prepared according to the detailed heads sanctioned in the Budget, at the end of the month.

9. Amounts payable by the University shall be disbursed in the following way by the Assistant Account Officer in charge of the University Audit Section out of the University Fund :—

- (i) By cheques drawn on the State Treasuries and the Imperial Bank of India, Trivandrum.

- (ii) By bank drafts through the Imperial Bank of India for foreign payments.

NOTE :—Remittances not exceeding Rs. 50 made outside Travancore may be drawn and remitted by the respective heads of institutions by Postal money orders debiting the commission to office contingencies.

10. All bills shall be audited before payment, by the University Audit Section.

11. In the case of original and maintenance works, whether executed by the Public Works Department or not, the procedure and instructions laid down in the Public Works Department Code will be followed. The bills in these cases will also be pre-audited by the Audit Section and cheques issued by the Assistant Account Officer in charge.

12. All payments will be on bills prescribed in the Travancore Account Code.

13. Every bill for payment shall be presented at the counter attached to the Audit Section, for which a token will be given. The bill will be pre-audited and cheques issued, if the claim is admissible. The token shall be returned when the cheque is issued or the bill is returned.

14. All payments on account of services rendered and articles supplied by Departments of Government will be made by cheque only.

15. The amounts deducted from bills on account of Premia for State Life Insurance, State Provident Fund account, Court attachment, etc., shall be consolidated at the end of the month and arranged to be remitted to the Treasury by the Audit Branch by means of cheques.

16. The bills after payment shall be classified daily in the Audit Section according to budget heads and the consolidated account of expenditure prepared at the end of the month.

17. On the basis of the Registers maintained in the Audit Section, there shall be prepared every month an abstract of progressive total of receipts and expenditure which will show the budget figures, the amounts realised or spent, as the case may be, up to the end of the month and the balance remaining to be realised or available for expenditure for the rest of the financial year. These statements shall be sent to the Registrar before the end of the succeeding month. A statement showing the opening balance of the Fund Account receipts and expenditure of the month and the closing balance of the month shall also be sent to the Registrar at the same time.

18. The Colleges and other institutions shall send before the 10th day of every month to the Officer in charge of the Audit Section statements of expenditure and D. C. B. statements for receipts, pertaining to the previous month. Statements of expenditure and receipts relating to the University Office shall be prepared in the Office of the Registrar and a copy thereof should be sent to the Audit Section.

13. For any period not exceeding one week between meetings of any University Authority or Body or adjourned meetings, if any members will be paid either halting allowance or T. A. for a second journey, whichever is less.

14. There will be a vacation period recognised by the University during the midsummer vacation for purposes of T. A. to Examiners and Members of the Syndicate *from the 1st of April to the 1st of June*. Vacation address will be recognised for purposes of T. A. only if the place from which T. A. is claimed is within the Madras Presidency and South Indian States including Mysore.

(a) An Examiner who is a member of a conducting Board or a Member of the Syndicate who has to travel on University business, will be entitled to T. A. from his vacation address provided he has previously intimated to the Registrar an address which he desires to be noted *as his vacation address*, for the period mentioned above. T. A. will be paid to and from the place named by the Examiner or the member of the Syndicate but for purposes of this rule only one vacation address will be recognised in the office and the Examiner or the member of the Syndicate will not be entitled to change this address during the vacation period for the purpose of claiming T. A. The minimum total period of residence at the vacation address during vacation should be not less than ten days. *Mere mention of the places in the T. A. bill will not be recognised as change of address for the purpose of this rule.*

(b) Other Examiners, *viz.*, Additional and Assistant Examiners will be paid T. A. from their usual place of business or wherever they may be, whichever is less, in respect of journeys made by them to attend meetings to receive instructions from the Chief Examiner in regard to the valuation of answer papers or to conduct practical Examinations.

(c) Examiners or members of the Syndicate who are unable from causes beyond their control, to go to the vacation address by the date already reported by them, will be entitled to draw T. A. from their usual place of business, provided such T. A. does not exceed the T. A. admissible from the vacation address.

15. Travelling or halting allowances will not, however, be paid to members if they have received or claimed from any other public body such allowances for the journeys which enabled them to attend the meeting of the University Body.

16. When a member is unable from any cause beyond his control to complete a journey or to attend the meeting for which the journey was made, he may draw T. A. from his headquarters or vacation address, whichever is less, to the place at which his journey was interrupted or the causes preventing his attendance occurred, and back, but he will not be entitled to any halting allowance.

#### V. Rules for the purchase of Stores.

With a view to securing economy in the purchase of stores, a Committee styled the University Stores Purchase Committee is constituted with the Dean, Faculty of Science, the Dean, Faculty of Technology, the Financial Secretary to Government and the Secretary to the Government Stores Purchase Committee as members, and the Registrar as Secretary.

Duties and powers  
of the Committee.

1. The Committee will discharge generally the following functions :—

(i) Consolidation and classification of indents for the purchase of stores sent up every year by the several institutions under the Syndicate.

(ii) Publication of information in as wide and effective a manner as possible.

(iii) Continuing in close touch with the market conditions and supplying correct information to the various institutions.

(iv) Obtaining and comparing of quotations.

(v) Collection of correct and up-to-date information regarding Indian Firms in general and Travancore Firms in particular which are able to satisfy any of the requirements of the several institutions.

(vi) Supervision and check in respect of contracts and enforcement of the terms of the contracts as regards delivery, prices, etc.

(vii) Making arrangements for carrying out tests of goods on delivery.

(viii) Generally serving as a co-ordinating agency for all the purchasing institutions under the University Syndicate.

2. The Committee will have jurisdiction over the purchase of such kinds of stores as are likely to be required by more than one institution in fairly large quantities and also over individual items of stores exceeding Rs. 500 in value. Indents for such stores should be sent to and purchases effected only through the Committee.

*Note 1 :—*The limit of Rs. 500 should not be taken to apply to the purchase of stores which are in common requisition and which taken in the aggregate are likely to exceed that limit in a year.

*Note 2 :—*Heads of Institutions should see that articles required for the whole year are, as far as possible, included in a single indent, and these indents should be sent to the Secretary, University Stores Purchase Committee, before the end of Medom every year, as soon as the Budget for the ensuing year is prepared and submitted. Every indent should be accompanied by a programme of supply and an estimate of cost.

3. Except in cases of emergency, a period of at least three months should invariably be allowed between the date of indent and the date on which the stores are to be delivered to the intending institution.

*Note :—*The Stores Purchase Committee does not stock any article, but acts merely as an agent.

4. On receipt of indents from the several institutions the following Procedure to be followed. procedure will be adopted by the Stores Purchase Committee :—

(a) All purchases in India shall be made by inviting tenders which may be—

- (i) by advertisement (open tender),
- (ii) by invitation to a limited number of firms (limited tender),
- (iii) by invitation of one firm (single tender) ;

(b) Competitive tenders should be invited except in the case of—

- (i) Patents and specialities,
- (ii) Highly finished work such as scientific apparatus.
- (iii) Pure chemicals of special quality.

(c) In the case of supplies of the value of Rs. 250 or less, auction or tender system should as far as possible, be adopted. If inconvenience or loss or delay is expected by adopting auction or tender system, an officer may obtain quotations from two or three firms and make purchases from the firm whose quotations are the lowest.

(d) The auction or tender system should invariably be adopted for all purchases exceeding Rs. 250 in value.

(e) Officers making purchases will see that a large purchase is not split up into several smaller ones for evading the rules relating to the larger purchases.

(f) After examination of the tenders received and comparing the price with the estimated cost noted in the indents and after consulting the indenting institution concerned, the Committee shall decide which tender shall be accepted.

(g) When a tender has been accepted by the Committee, such acceptance shall be communicated to the successful tenderer, to the institution concerned and also to the Accountant-General.

(h) The Registrar shall arrange to obtain the necessary agreement from the successful tenderer embodying the conditions of the order and providing for the necessary penal clauses for any breach of conditions of contract. Copies of such contracts shall be forwarded to the Stores Purchase Committee and the Accountant-General.

(i) The contracts relating to normal requirements may be allowed to run for one year from the date they are let, [special requirements being dealt with separately.

5. In all cases in which stores are purchased, arrangements shall be made to obtain three sets of shipping documents. Shipping Documents. One set shall be forwarded to the Receiving Agents, another set to the Indenting Officer and the third to the Secretary, Stores Purchase Committee. On receipt of the shipping documents, the indenting officer shall issue necessary instructions to the Receiving Agents in the matter of transmission of the Packages etc., copies of such correspondence being simultaneously forwarded to the Secretary, Stores Purchase Committee.

6. When articles of the kind required are produced in the Travancore State, such local articles should be purchased by preference, provided the price is not 5 per cent. higher than that at which articles of similar quality can be obtained elsewhere. Selection of articles.

7. When articles of the kind required are not produced or manufactured in Travancore, but are produced or manufactured in other parts of the Indian Empire, such Indian articles should be purchased by preference, provided their quality, whether manufactured from Indian or imported materials, is sufficiently good for the purpose and the price charged is not unfavourable.

8. The above rules apply to all kinds of articles whether manufactured or unmanufactured and also to works *mutatis mutandis* executed on behalf of the University or of any institution under its control. Extent of application.

9. The following are exempted from the operation of these rules :—

- (a) Sewing materials required for any examination;
- (b) Books;
- (c) Petty purchases of Rs. 25 or less.



# VI. RULES FRAMED BY THE SYNDICATE FOR THE TRANSFER AND COUNTING OF VOTES UNDER SECTION 28

## (ii) OF CHAPTER XVI OF THE STATUTES.

### 1. In these rules—

(1) “first preference” means the figure 1 set opposite the name of any candidate ; “second preference” similarly means the figure 2, “third preference” the figure 3 and so on ;

(2) “original votes” in regard to any candidate means the votes derived from ballot papers on which a first preference is recorded for such candidate ;

(3) “continuing candidates” means candidates not elected or not excluded from the poll at any given time ;

(4) “exhausted papers” means ballot papers on which no further preference is recorded for a continuing candidate : provided that a paper shall also, be deemed to be exhausted in any case in which—

(a) the names of two or more candidates, whether continuing or not, are marked with the same figure and are next in order of preference, or

(b) the name of the candidate next in order of preference, whether continuing or not is marked,

(i) by a figure not following consecutively after some other figure on the ballot paper, or

(ii) by two or more figures :

(5) “surplus” means the number by which the votes of any candidate, original and transferred, exceeds the quota as defined in Section 26 of Chapter XVI of the Statutes ;

(6) “transferred votes” in regard to any candidate means vote credited to such candidate, which are derived from ballot papers on which a second or subsequent preference is recorded for such candidate ;

(7) “unexhausted papers” means ballot papers on which a further preference is recorded for a continuing candidate.

II. In carrying out the operations of transfer prescribed in the following rules :—

(1) all fractions shall be disregarded ; and

(2) all preference recorded for candidates already elected excluded from the poll shall be ignored.

III. (a) If, in ascertaining the number of papers to be transferred from a sub parcel, fractional parts are found to exist and if, owing to the existence of such fractional parts, the number of papers to be transferred is less than the surplus, as many of these fractional parts taken in the order of their magnitude, beginning with the largest, as are

necessary to make the total number of papers to be transferred equal to the surplus, shall be reckoned as of the value of unity, and the remaining fractional parts shall be ignored. If two or more fractional parts are of equal magnitude, that fractional part shall be deemed to be the larger which arises from the largest sub-parcel, and if the sub-parcels in question are equal in size, preference shall be given to the candidate who obtained the larger number of original votes.

(b) If more than one candidate has a surplus, the largest surplus shall be dealt with first and the others in order of magnitude :

Provided that every surplus arising on the first count of votes shall be dealt with before those arising on the second count, and so on.

(c) Where two or more surpluses are equal, the Registrar shall decide, as hereinafter provided in Rule VIII which shall be first dealt with.

(d) (i) If the surplus of any candidate to be transferred arises from original votes only, all the papers in the parcel belonging to the candidate whose surplus is to be transferred shall be examined and the unexhausted papers divided into sub-parcels according to the next preferences recorded thereon. A separate sub-parcel shall also be made of the exhausted papers.

(ii) The number of the papers in each sub-parcel and the total of all the unexhausted papers shall then be ascertained

(iii) If the total number of unexhausted papers is equal to or less than the surplus, all the sub-parcels shall be transferred to the continuing candidates.

(iv) If the total number of the unexhausted papers is greater than the surplus, there shall be transferred from each sub-parcel the number of papers which bears the same proportion to the number of papers in the sub-parcel as the surplus bears to the total number of unexhausted papers.

(e) If the surplus of any candidate to be transferred arises from transferred as well as original votes, all the papers in the sub-parcel last transferred to the candidate shall be re-examined and the unexhausted papers divided into sub-parcel according to the next preference recorded thereon. The sub-parcels shall then be dealt with in the same manner as is provided in the case of the sub-parcels referred to in clause (d).

(f) The papers transferred to each candidate shall be added in the form of a sub-parcel to the papers already belonging to such candidate.

(g) All papers in the parcel or sub-parcel of an elected candidate not transferred under the Statute shall be set aside as finally dealt with.

IV. (1) After all the surpluses have been transferred and the candidate lowest on the poll excluded under Section 29 of the Statutes the unexhausted papers of that candidate shall be distributed among the continuing candidates. Exhausted papers, if any, shall be set aside as finally dealt with.

(2) The paper containing original votes of an excluded candidate shall first be transferred.

(3) The papers containing transferred votes of an excluded candidate shall then be transferred in the order of the transfer in which he obtained them.

(4) Each of such transfers shall be deemed to be a separate transfer.

(5) If the total of the votes of the two or more candidates lowest on the poll, together with any surplus votes not transferred, is less than the votes credited to the next highest candidate, those candidates may, in one operation be excluded from the poll and their votes transferred to the continuing candidates according to the next preference recorded thereon and in accordance with the directions given in clauses (2) to (4) above.

(6) The process directed by this rule shall be repeated on the successive exclusions of the candidates lowest on the poll until the last vacancy is filled either by the election of a candidate with the quota or as hereinafter provided.

V. If as a result of the transfer of papers under these rules the number of votes obtained by a candidate is equal to or greater than the quota, the transfer then proceeding shall be completed but no further papers shall be transferred to him.

VI. (1) If after the completion of any transfer under these rules the number of the votes of any candidate shall be equal to or greater than the quota, he shall be deemed elected.

(2) If the number of the votes of any such candidate shall be equal to the quota, the whole of the papers on which such votes are recorded shall be set aside as finally dealt with.

(3) If the number of the votes of any such candidate shall be greater than the quota, his surplus shall thereupon be distributed before the exclusion of any other candidate.

VII. When only one vacancy remains unfilled and there are only two continuing candidates, and those two candidates have each the same number of votes and no surplus remains capable of transfer, one candidate shall be excluded under the next succeeding rule and the other deemed elected.

VIII. If, when there is more than one surplus to be distributed, two or more surpluses are equal or if at any time it becomes necessary to exclude a candidate and two or more candidates have the same number of votes and are lowest on the poll, regard shall be had to the original votes of each candidate, and the candidate for whom fewest original votes are recorded shall have his surplus first distributed or shall be first excluded, as the case may be. If the number of their original votes is equal, the Registrar shall decide by lot which candidate shall have his surplus distributed or be excluded.

IX. Any candidate or his agent may, at any time during the counting of the votes, either before the commencement or after the completion of any transfer of votes (whether surplus or otherwise), request the Registrar to re-examine and recount the papers of all candidates or of any candidate (not being papers set aside at any previous transfer as finally dealt with) and the Registrar shall forthwith re-examine and recount the same accordingly. The Registrar may also at his discretion recount votes, either once or more often, in any case in which he is not satisfied as to the accuracy of any previous count, provided that nothing herein shall make it obligatory on the Registrar to recount the same votes more than once.

X. The Registrar shall prepare and maintain a form showing:—

- (1) the number of voters who voted.
- (2) the number of ballot papers rejected:
  - (a) as being received too late.
  - (b) for being sent in other than prescribed ways.
  - (c) for irregularities connected with the declaration.
  - (d) as invalid.

## HIS HIGHNESS THE MAHARAJA'S UNIVERSITY COLLEGE, TRIVANDRUM.

1. *Historical Sketch.* This institution was founded in 1834 as His Highness the Raja's Free School with the object of providing education in English for His Highness' subjects. In 1869, the standard of instruction was raised to the First examination in Arts and Bachelor of Arts Courses of the Madras University and the institution came to be called "His Highness the Maharaja's College, Trivandrum". The College was affiliated for the B. A. Degree course of the Madras University successively in Philosophy, Mathematics, Chemistry, History, Physics and Sanskrit and Dravidian Languages. The College was also affiliated for B. A. Honours Degree in English and History in 1914. Provision for the study of Natural Science in the Intermediate course was made in 1922. The Degree course in Philosophy which was suspended previously was revived in 1925.

In 1924, the Government of His Highness the Maharaja decided to separate the Arts and Science Departments. The bifurcation was given effect to in accordance with G. O. R. O. C. No. 395 of 23. Legis. E. dated 9th May 1924 and H. H. The Maharaja's College of Arts was opened on the 4th July 1924 in a new pile of buildings. The Science Departments were retained in the old buildings and the institution was designated His Highness the Maharaja's College of Science. After the bifurcation, His Highness the Maharaja's College was affiliated for B. A. (Hons) course in Mathematics in 1925 and for the B. A. pass course in Botany and Zoology in the years 1924 and 1931 respectively. In His Highness the Maharaja's College of Arts, the B. A. course in Philosophy was re-opened in 1925. The Honours course in Malayalam was started in 1935 and the Honours course in Sanskrit in 1939.

With the starting of the University of Travancore, the Colleges were transferred to and placed under the maintenance and control of the University. The B. A. courses in Science subjects, Pass and Honours were designated B. Sc. course. When the Engineering College and the Institute of Textile Technology were started, arrangements were made for providing instruction to the students of these institutions in Physics and Chemistry in the Science College.

The question of amalgamating the two Colleges was raised at the very start of the University and was under the consideration of the University and the Government. Government finally sanctioned the

shifting of the College of Arts from its present site and its amalgamation with the College of Science, with effect from the academic year 1942—43 in G. O. R. O. C. No. 4709/41 Edn. dated 29-10-1941. The premises and the buildings of the English High School for Girls were placed at the disposal of the University for providing the necessary additional accommodation.

2. *Buildings.* As a transitory measure, the Intermediate and the B. A. and B. Sc. classes in English, Indian languages and History are held in the Main Building. The construction of a separate block for the Biology Department is under consideration. The Honours classes in English, History, Sanskrit and Malayalam are held in the former Girls' School compound where arrangements have also been made for holding classes in Philosophy and for some of the classes in English. When the proposed Biology block is ready, the entire main building of the College will be reserved for the teaching of Languages to the pass classes, the Science Department's being located to the west of the main building and the Arts Departments and Honours courses in languages housed across the main road in the Girls' School building. A major portion of the general library of the Arts College is retained in the old Arts College building where it is to serve as the nucleus of the University Library.

3. *Administration* The internal administration of the College is vested in the Principal who acts in consultation with the College Council.

4. *Courses of Studies:* The College provides instruction for the Intermediate, B. A., B. Sc., B. A. Hons., B. Sc., Hons., M. A. and M. Sc. Degree courses of the Travancore University in English and the following branches.

#### *Intermediate.*

Part II:—Malayalam, Tamil, Sanskrit, French, Hindi and Arabic.

Part III:—

- (i) Mathematics, Physics and Chemistry.
- (ii) Physics, Chemistry and Biology.
- (iii) Ancient History, Indian History and Logic.
- (iv) Ancient History, Indian History and Modern History.

#### *B. A. Degree Examination.*

Part II:—As for Intermediate.

Part III:—

Group (i-a) Psychology, Ethics and Logic

Group (ii-a) History, Economics and Politics.

Group (iii-b) Malayalam with Early South Indian History or Sanskrit.

*B. Sc. Degree Examination.*

Part II:—As for B. A.

Part III:—Group	Main subject	Subsidiary subject.
I	Mathematics	(a) Mathematics (b) Physics
II	Physics	(a) Mathematics (b) Chemistry
III	Chemistry	(a) Physics (b) Botany (c) Zoology
IV	Botany	(a) Chemistry (b) Zoology
V	Zoology	(a) Chemistry (b) Botany.

*B. A. Honours.*

Branch II. History and Economics

do. III. English Language and Literature

do. IV. Sanskrit Language and Literature

do. V. Malayalam language and Literature.

*B. Sc. Honours.*

Branch I Mathematics.

*Research.*

Admission is given to post graduate students for research in different branches of study. In the Science Department the research activities of the College are carried on in the closest co-operation with the Central Research Institute in the University.

*5. Scholarships.**I. General.*

(1) The following account is merely a *summary* of the rules of award of the various scholarships, prizes and medals available to the students of the College and no statement contained herein can supersede the provision in the rules of award.

(2) No two scholarships can be held by the same student concurrently except by specific and appropriate sanction.

(3) An award may not be made if there are no deserving students

(4) Scholarships are liable to be withheld temporarily or forfeited in the event of continued absence, negligence in studies, misbehaviour or want of progress. No scholarship shall be held for more than one year in the same class,

## II. HIS HIGHNESS THE MAHARAJA'S SCHOLARSHIPS.

### *Open.*

(a) Only subjects of His Highness the Maharaja are eligible for the scholarships.

(b) The scholarships awardable in the College shall be of two kinds, the first of the value of Rs. (10) ten each per mensem, and the second of the value of Rs. (15) fifteen per mensem.

*Note.*—The present value of the scholarships is Rs. 7-14-0 and Rs. 11-7-0 respectively.

(c) *Scholarships of the value of Rs. (10) ten.* These scholarships, fourteen in number are tenable for two years and are awarded on the results of the E. S. L. C. Examination on a regional basis to students of recognised high schools in the State. Only pupils who secure the certificate after one year's study in Form VI and continue their studies in the year immediately following for the Intermediate Examination of the University in any College in the University (or for the Diploma course in the Engineering College) are eligible for the award.

(d) *Scholarships of the value of Rs. (15) fifteen.*

(a) Three scholarships are awarded to students who pass the Intermediate Examination from Colleges in the University and are allotted as below :—

(i) One each to students from His Highness the Maharaja's College for Women, C. M. S. College, Kottayam the Scott Christian College, Nagercoil, St. Berchmans' College, Changanacherry and the Union Christian College, Alway.

(ii) Four to students of this College out of which two shall be reserved for students who take Arts subjects and two for those who take Science subjects for the Intermediate.

(b) Only students who pass the Intermediate Examination within two years after joining the Intermediate class, and continue in the B. A. or B. Sc. Pass or Honours classes or the B. Sc. (Eng.) class in the College of Engineering, Trivandrum, in the academic year immediately following that in which they were in the Intermediate class, are eligible for the scholarships.

(c) Each scholarship is tenable for the whole of the B. A. or B. Sc. (Pass or Honours) or B. Sc. (Eng.) course as the case may be.



### III. HIS HIGHNESS THE MAHARAJA'S SCHOLARSHIPS.

*Close.*

(a) These scholarships are awarded on similar conditions and are of the same value as the open scholarships but they are reserved for award to communities, backward in point of education, as enumerated in G. O. D. Dis No 1070 of 37 Edn., dated 13th July 1937 regarding fee concessions.

(b) Eight such scholarships are awarded on a regional basis, to pupils who pass the E. S. L. C. Examination and four are awarded according to merit, to those who pass the Intermediate Examination from any College in the University.

### IV. GOVERNMENT MUHAMMADAN SCHOLARSHIPS.

(a) Two scholarships tenable in any College in the University are awarded annually to *poor* and deserving Muhammadan students of the Junior Intermediate class who are subjects of His Highness the Maharaja of Travancore.

(b) The scholarships are ordinarily tenable for four years, but in the case of a student who takes up an Honours course after passing the Intermediate Examination, the period of tenure is extended to five years. The present value of the scholarships is Rs. 7 chs. 14 in the Intermediate class and Rs. 11 chs. 7 in the B. A. or B. Sc. Pass and Honours classes.

(c) The scholarship holders are selected on the results of the E. S. L. C. Examination, other points such as age and poverty being taken into consideration in awarding the scholarships.

### V. LADY WILLINGDON SCHOLARSHIPS.

Four scholarships, tenable for 2 years (or 3 years for Honours students) in any College in the University or in the Queen Mary's College and the Presidency College, Madras (only for courses of study not provided for in this University) are awarded each year to women students who obtain the highest rank in the Intermediate Examination of the University and who continue their studies for the B. A. or B. Sc. (Pass or Honours) course. Only subjects of H. H. the Maharaja of Travancore, who pass the Intermediate Examination in two years are eligible for the scholarship.

### VI. GRIGG SCHOLARSHIP.

A scholarship of the value of Rs. (14) fourteen tenable for two years, is awarded to the students who passes highest in the Intermediate Examination, of the Madras University from any institution in Travancore and who prosecutes his studies for the B. Sc. Degree in this College.

## VII. READ MEMORIAL SCHOLARSHIP.

(a) A scholarship of the value of Bh. Rs. (15) fifteen per mensem is awarded every alternate year on the results of the Intermediate Examination of the University to the most deserving student who satisfies the following conditions:—

(i) He shall have taken the whole of his Intermediate course and shall continue his education in this College.

(ii) He shall take Chemistry as his main subject in the B. Sc. Degree Examination.

(iii) He shall satisfy the Principal that he needs pecuniary assistance to continue his education.

(b) If there be no eligible candidate in Chemistry in any particular year, the scholarship may be awarded and continued to a student who has taken Physics as his main subject in the B. Sc. Degree Examination and who *mutatis mutandis* satisfied the above conditions.

## VIII. MITCHELL MEMORIAL SCHOLARSHIP.

Two scholarships each of the monthly value of Bh. Rs. (12) twelve and tenable for four years, are awarded to students of the Junior Intermediate class who choose Group I, on the average marks they obtained for the Travancore E. S. L. C. Examination in English, Elementary Mathematics and Elementary Science.

## IX. RAMIENGAR SCHOLARSHIPS.

(a) Two scholarships each of the value of Bh. Rs. (15) fifteen per mensem and tenable for two years, are awarded, for one year in the first instance, on the results of the Intermediate Examination of the University to students who shall be subjects of Travancore and who shall continue their education in this College taking Group III (Chemistry Main) in the B. Sc. course.

(b) *Inter alia* the pecuniary circumstances of candidates shall be taken into consideration in awarding the scholarships.

## X. CULLEN SCHOLARSHIPS.

Two scholarships of the annual value of Rs. 112-6-2 and ordinarily tenable for two years are awarded to students who are subjects of H. H. The Maharaja of Travancore and who pass highest in the Intermediate Examination of the University of Travancore from a College in Travancore in two years after joining the Intermediate and continue, one for the B. A. course (Pass or Honours) and the other for the B. Sc. course (Pass or Honours), immediately afterwards in this College.

### XI. ANANTARAMIER SCHOLARSHIPS.

(a) Only Mukkani Brahmins are eligible for the scholarships.

(b) One scholarship of the value of Bh. Rs. (15) fifteen per mensem is awarded every year to a Mukkani Brahmin student to be selected by the College Council from among those admitted into the Junior Intermediate class in the College.

(c) One scholarship of the value Bh. Rs. (15) fifteen per mensem is awarded every year to a Mukkani Brahmin student to be selected by the College Council from among those admitted into the Junior B. A. or B. Sc. class in the College.

(d) Each of the two scholarships above mentioned is renewable for a second year, provided the progress and conduct of the holder are satisfactory.

(e) In the event of there being no Mukkani Brahmin student in the Junior Intermediate or in the Junior B. A. or B. Sc. classes in any year, the unallotted scholarship or scholarships shall be awarded by the College Council for one year, to a Mukkani Brahmin student in the senior classes.

(f) If after all the scholarships have been awarded under rules (b), (c) and (d) in any year there remain a scholarship not so awarded it may be awarded to any Mukkani student in any of the College classes.

### XII. GURUSWAMI NADAR'S SCHOLARSHIPS.

(a) There are two scholarships each tenable for two years, one of which not exceeding Bh. Rs. (12) twelve per mensem is awarded to a student of the Intermediate class, Group I, who has obtained the highest number of marks in the E. S. L. C. Examination in English, Elementary Mathematics and Elementary Science, the other not exceeding Bh. Rs. (18) eighteen per mensem is awarded to a student who passes the Intermediate Examination from one of the Colleges in Travancore, whether a native of Travancore or not, on the marks which he obtained in the Examination and who undertakes to study for the B. Sc. Degree Examination in Chemistry (Main) preference being given to the student who has held the scholarship in the Intermediate class.

(b) Eighteen years shall be the maximum age limit in the case of the scholarship to a student joining the Intermediate class and twenty years in the case of the one joining the B. Sc. class.

### XIII. T. SANKARAN TAMPIL SCHOLARSHIPS.

(a) Only Nayar students who are subjects of H. H. The Maharaja are eligible for the scholarships. The term "Nayar" shall have the meaning assigned to it under the Nayar Act I of 1088.

(b) There are two scholarships, one of the monthly value of Br. Rs. (7) Seven, and the other of the monthly value of Bh. Rs. (9) nine.

(c) One scholarship of the monthly value of Bh. Rs. (7) seven, tenable for two years is awarded to the Nayar student in the Junior Intermediate class of this College, who among the students who take up Group I or Group II as their optional subject, has secured the best English School Leaving Certificate, judged by the marks in the Public Examination in the immediately preceding school year after remaining one year only in Form VI.

(d) Another scholarship of the monthly value of Bh. Rs. (9) nine tenable for two years is awarded to the Nayar student in the junior class of the Pass course of the B. Sc. Degree Examination who, among the students who take up Branch I Mathematics (Main) or Branch II Physics (Main) or Branch III Chemistry (Main) as their optional subject, has secured the highest number of marks in English and in Part III (Science subjects only) put together in the immediately preceding Intermediate Examination and who has passed the Intermediate Examination as a whole within two years after joining the Intermediate class.

#### XIV. READ SCHOLARSHIPS.

(a) The scholarships shall be awarded to deserving students, who are natural born or domiciled Travancoreans and who after completing the Intermediate course in any of the Colleges in Travancore join this College for the B. Sc. course taking Chemistry, Physics, Botany or Zoology as main subject.

(b) There shall be two scholarships of the monthly value of Bh. Rs. (7) seven each, awarded one to a student in the Chemistry section, and the other to a student in the Physics, Botany or Zoology section by rotation.

#### XV. SRI MULAM SATTANATHAN SCHOLARSHIP.

This Scholarship of the value B. Rs. 150 per annum is awarded to a poor and deserving Yadava student who passes from the Sri Mulam Shashtipurthi Sattanathan English High School, Shencottah and prosecutes his studies in the Intermediate class in either this College or the Women's College, Trivandrum. If no such Yadava student is available in any particular year, the scholarship shall be awarded to any other poor and deserving Yadava student who passed the E. S. L. C. Examination from any other school in the State. If no such Yadava student is available, the award will be made to a Yadava student in the Senior Intermediate or Junior or Senior B. A. or B. Sc. classes in the order stated above. In case no such Yadava student is available, the scholarship shall be awarded to a poor and deserving pupil of any

community who passed the E. S. L. C. Examination from the Shencottah English High School.

#### XIV. THE VICTORIA SCHOLARSHIP.

One Scholarship, of Bh. Rs. 10 per<sup>1</sup> mensem, is awarded to a poor and deserving student who passes the Intermedidate Examination from this College with one of the Arts groups as optional and prosecutes his studies for the B. A. Pass or Honours Examination in the College.

#### XVII. THE RAMA RAO SCHOLARSHIP.

One Scholarship, of the value of Bh. Rs. 4 per mensem, tenable for two years, is awarded to a poor student, who is a native of Travancore and who, after passing the English School Leaving Certificate Examination, continues his studies in the Intermediate class in the College with one of the Arts Groups as his optional.

#### XVIII. THE HODGSON MEMORIAL ENGLISH LITERATURE SCHOLARSHIP.

One Scholarship of the value of Bh. Rs. 180 per annum is awarded to a student of the English Honours class, who among those who appeared for the Intermediate Examination after the minimum period of study for that examination, secured the highest mark in English, and was not more than 19 years of age on the first of April in the year of the Examination.

#### XIX. LADY RAJAGOPALACHARI SCHOLARSHIPS.

Two scholarships of the value of Bh. Rs. (15) fifteen each, are tenable for two years only in the B. A. and B. Sc. (Pass and Honours) classes. The scholarships are awarded by the Syndicate in consultation with the Senior member of the family of Lady Rajagopalachari to Lady students of the Nair community who are in need of monetary help.

#### XX. THE RAO SAHIB UDARASIROMANI T. PADMANABHA RAO SCHOLARSHIP.

One scholarship of the value of Rs. (10) Ten tenable in the Intermediate classes of this College is awarded by the Syndicate to a poor student. Other things being equal, preference is given to a Brahmin student and among Brahmins to a Mahratta Brahmin. The scholarship is continued in the B. A. or B. Sc. Pass or Honours classes if the holder continues his study after passing the Intermediate examination in the minimum period.

## XXI. THE TEMPLE ENTRY PROCLAMATION MEMORIAL ENDOWMENT.

Under this endowment scholarships called ‘The Sri Chitra’, ‘Setu Parvati Bayi’ and ‘The Sachivottama Sir C. P. Ramaswami Aiyar’ scholarships are awarded by a Sub-committee to promote education among the educationally backward communities. The awards are made by this Committee with special reference to the order and the proportion of backwardness of the communities concerned as determined by the statistics of literacy amongst them. The applications for these scholarships should be made to the Protector of Backward Communities, who is the Ex-officio Secretary of the Committee.

### 6. PRIZES AND MEDALS.

#### I. BOYLE MEMORIAL PRIZE.

A prize of the value of Rs. 50 (fifty) is awarded annually to the student who does best in English in the Junior B. A. or B. Sc. class on the results of the regular College Examinations.

#### II. MAHADEVA IYER GOOD CONDUCT PRIZE.

(a) There are two prizes in the form of gold pendants each of the value of B. Rs. 35 (thirty five) with the following motto engraved in the centre in Sanskrit and English on either side. “Sathyam Vada, Dharman Chara Speak the Truth Do Your Duty”.

(b) One prize is awarded annually to a student in class IV (second year of the B. A. or B. Sc. Pass or Honours course) and the other to a student of class I (first year of the Intermediate course) of the College selected by the votes of the students in the class subject to approval by the College Council.

(c) The same student shall not be eligible for the prize in more than one class during his College Course.

(d) Only first year students in Class I and IV are eligible for the prize.

#### III. ROSS GOLD MEDAL

This medal of the value of B. Rs. 56 (fifty six) is awarded annually to the student who occupies the highest place among Travancoreans who pass the B. A. or B. Sc. Honours Degree Examination from the College and is placed in the first or second class.

#### IV. NATESA AIYAR'S SRI MULAM RAMA VARMA MAHARAJA MEDAL.

(a) The medal is awarded annually to the student who passes highest from the College in the B. Sc. Honours Degree Examination

of the Travancore University in Mathematics after the minimum period of study and in the first year of his appearing for the examination.

(b) The medal is made of gold not lower in carat than a sovereign and it has, inscribed on one side, the name of the winner and on the other, the name of the College and the words 'K. V. Natesa Aiyar's Sri Mulam Rama Varma Maharaja Medal'. The value of the Medal including the cost of making it shall be B. Rs. (50) fifty.

#### V. THE HARVEY MEMORIAL PRIZE.

A prize of the value of Rs. 42 is awarded to the best English essayist in the Senior B. A. or B. Sc. class and the Preliminary Honours classes.

#### VI. THE RAMA KURUP MEMORIAL PRIZE.

A prize of the value of Rs. 14 awarded annually to the student of this College who passes highest in Malayalam (Optional) in the B. A. Degree Examination and also qualifies at the same time for his degree in all parts. If in any year no student passes at least in the Second class in Malayalam, the prize shall not be awarded.

#### VII. THE SULAPANI VARIER PRIZE.

A prize of the value of B. Rs. 7 is awarded annually to the student who among those who prosecute their studies in this College secured the highest place in Malayalam (Second Language) in the E. S. L. C. Examination of the year immediately preceding the date of his admission to the College.

#### VIII. THE LEPPER MEMORIAL GOLD MEDAL.

Two gold medals are awarded every year on the results of the University Examinations to successful candidates for proficiency in Economics, one of which will be given to the Honours student in Branch III who passes in the first or second class and obtains the highest number of marks in Economics, which should not be less than fifty per cent. of the maximum, and the other to the B. A. pass student who does best in Economics and whose mark in that subject is not less than sixty per cent. of the maximum.

#### IX. THE LA BOUCHARDIERE MEMORIAL PRIZE.

One prize of the value of B. Rs. 70 is awarded annually to the student of this College who stands first among the candidates who appear for the B. A. (Hons.) Examination in English and pass the examination and qualify for the Honours Degree.

#### X. MR. P. SANKUNNI MENON, DEWAN PEISHEAR'S GOLD MEDAL.

This Medal is awarded to the Nair student of the B. A. Honours class (History Branch) of this College who passes the B. A. (Honours)

Degree Examination and who gets the highest number of marks in the branch among those who pass the Examination. In case there is no eligible candidate in the Honours class, the medal is awarded to a Nair student who passes the M. A. Degree Examination in History.

#### XI. THE GANAPATHI PILLAI MEMORIAL PRIZE.

(a) A prize of the value of Rs. 10 in the form of books is awarded annually to the student of the College who passes the Intermediate Examination in his first attempt within the minimum period of two years and secures the highest marks in Tamil (Optional) or Tamil second language if there are no candidates who offer Tamil (Optional).

(b) The prize will not be awarded if the candidate fails to secure 50 per cent. of the marks.

#### XII. THE RAVI VARMA MEMORIAL GOLD MEDAL.

It is awarded to the student who stands first in Philosophy among the successful candidates for the B. A. Degree Examination presented from the College provided he or she is placed not below the second class in Part II.

#### XIII. THE A. R. RAJA RAJA VARMA MEMORIAL PRIZE.

A prize of Rs. 6 in the form of books is awarded to the student who takes Malayalam and Sanskrit as his optional Group in the B. A. course and who in passing all the parts of the B. A. Degree Examination after the minimum period of study in the B. A. class, secures at least a second class and the first place in that group among the students of the College.

#### XIV. THE RAO SAHIB UDARASIROMANI T. PADMANABHA RAO GOLD MEDAL.

This medal is awarded annually by the Syndicate in consultation with the College Council to the best among the students who qualify for a Degree of the University from the College.

#### XV. HER HIGHNESS MAHARANI SETU PARVATI BAI PRIZE.

This prize is awarded annually by the Syndicate to the student who takes up Astronomy for his B. Sc. course, passes the Examination in his first attempt and secures the highest mark in Astronomy.

#### XVI. THE N. KRISHNASWAMI AIXAR MEMORIAL MEDAL.

This medal is awarded annually by the Syndicate to the candidate who stands first in the B. Sc. Pass Examination with Chemistry as his main subject and qualifies for the Degree.

#### XVII. THE AMMUKUTTI RAJAGOPALACHARI MEDAL.

A gold medal of the value of Bh. Rs. (60) sixty is awarded to the Nair Lady who graduates from any of the Colleges in the University and wins the highest academic distinction.



## 7. Rates of Fees.

The rates of fees in the college are as follows :—

*Per academic year.*

Intermediate Course	S. Rs. (84) eighty-four only, Rs. 28, Rs. 14 and Rs. 42 for Parts I, II and III, (res- pectively.
B. A. & B. Sc., Pass & Honours Course, and Post Graduate Course	S. Rs. (108) one hundred and eight only (Rs. 36, Rs. 18 and Rs. 54 for Parts I, II and III, respectively for the Pass Course).
Post Graduate Research course	B. Rs. (15) fifteen only per term for Chemistry, Botany & Zoology and Physics; and B. Rs. (10) ten for other subjects.
Special Practical work for failed students of the B. Sc. class	Rs. (27) twenty-seven only per term.
Library fee	S. Rs. (2) two only.
Athletic fee (Men)	S. Rs. (4) four only.
do. (Women)	S. Rs. (2) two only.
Stationery fee	S. Rs. (1) one only.
Health Service fee	S. Rs. (1) one only.
Magazine and Associa- tion	B. Rs. (1) one only.
Matriculation registration fee	B. Rs. (2) two only.
<b>Laboratory fees:—</b>	
<b>(i) Intermediate course :—</b>	
Mathematics, Physics and Chemistry	S. Rs. (5) five only.
Physics, Chemistry and Biology	S. Rs. (7) seven only.
<b>(ii) B. Sc. course:—</b>	
All groups except Mathe- matics	S. Rs. (10) ten only.

Full fee concession is given to students of educationally backward communities with a literacy of less than 10 per cent. of the population of 7 years and above.

Muhammadan students are allowed the concession of paying tuition fee at half rates, provided they are poor.

Fee concessions are allowed to deserving students of other communities provided that they are poor, consideration being given to their merits and the backwardness of the community in respect of education.

#### 8. Numerical Strength (1942—43.)

Junior Intermediate	Mathematics, Physics, Chemistry	130
	Physics, Chemistry, Biology	119
	Ancient History, Indian History, Modern History	66
	Ancient History, Indian History, Logic	37
Senior Intermediate	Mathematics, Physics, Chemistry	123
	Physics, Chemistry, Biology	97
	Ancient History, Indian History, Modern History	62
	Ancient History, Indian History, Logic	34
Junior B. A.		
	Group (i-a) Philosophy	27
	Do. (ii-a) History and Economics	59
	Do. (iii-a) Sanskrit and Early Indian History	1
	Do. (iii-b) Malayalam and Sanskrit	5
Senior B. A.		
	Group (i-a) Philosophy	13
	Do. (ii-a) History and Economics	60
	Do. (iii-a) Sanskrit and Early Indian History	1
	Do. (iii-b) Malayalam and Sanskrit	4
B. A. Honours.		
Branch II. History and Economics		
	1st year	7
	2nd year	11
	3rd year	17
Branch III. English Language and Literature		
	1st year	8
	2nd year	9
	3rd year	11

## Branch IV. Sanskrit Language and Literature

1st year	Nil.
Post Graduate course	
2nd year	4
3rd year	1

## Branch V. Malayalam Language and Literature

1st year	2
2nd year	Nil.
3rd year	5

## Junior B. Sc.

(According to main subject.)

Mathematics	38
Physics	44
Chemistry	46
Botany	27
Zoology	30

## Senior B. Sc.

(According to main subject)

Mathematics	28
Physics	45
Chemistry	45
Botany	25
Zoology	24

## B. Sc. Honours.

## Branch I—Mathematics.

1st year	24
2nd year	10
3rd year	4

## 9. Physical Education.

There are facilities for a variety of games (Tennis, Football, Volley ball, Basket ball, Badminton, Hockey, Cricket and Tennikoit). There are, besides, a gymnasium equipped with up-to-date apparatus, a running track and a jumping pit. Arrangements are also made for net practice in cricket.

Provision is also made for the athletic activities of lady students. A Badminton Court and a Tennis Court are set apart for them.

### 10. Hostels.

Accommodation is provided for the students of the College along with students of other institutions in the University in H. H. The Maharaja's Collegiate Hostel and also in the "Students' Hall" which is a separate Hostel under the management of the University Board of Physical Education. Provision for the residence of men students is also available in the L. M. S. Hostel, Y. M. C. A. Hostel, Catholic Hostel, S. N. V. Students Home, the Nair Union Hostel and other Hostels maintained by private agencies. Women students can find accommodation in the Holy Angels' Convent, College Hostel for Women, Hindu Vanita Sangham Hostel, S. N. V. Sadanam, Bethany Hostel, Zenana Mission Hostel and in the Hostel of the Y. W. C. A., Trivandrum.

### 11. The University Co-operative Society.

The College organised a Co-operative Society called the Maharaja's College of Science Co-operative Stores Ltd., (No. 1955). From humble beginnings, the stores has developed into an important organization and has been converted into "the Travancore University Co-operative Stores." It is now housed in a separate building in the College compound and has branches in other University Institutions.

The objects of the stores are the encouragement of thrift and self-help among students, the purchase of books, stationery and other articles required by members and associates and the dissemination of the knowledge of co-operative principles and as far as practicable their realisation. Its operations are confined to all the Colleges and other institutions under the University situated within the municipal limits or Trivandrum.

The capital of the society is Rs. 5,000 made up of shares of Re. 1 each. All students of the Colleges and other institutions under the University situated in Trivandrum who are over 18 years of age and all members of the staff, present and past are eligible for membership. Students below the age of 18 can become associate members.

#### *Staff of the College.*

Principal. Dr. H. Subramonia Aiyar, M. A., Ph. D. (Acting.)

#### *English Department.*

Professors. Mr. P. G. Sahasranama Aiyar, M. A. (Acting Principal on leave)

„ E. T. Thomas, M. A., L. T. (Madras) B. A. Tripot  
(Cantab).

„ G. Gopalakrishna Aiyar, M. A.

Assistant Professors.	Dr. A. Sivaramasubramonia Aiyar, B. A. (Hons.) Ph. D.
	Mr. S. Ramiah, B. A. (Hons.)
	„ M. Raghava Varma B. A. (Hons.)
	„ S. Sivarama Pillai, B. A. (Hons.)
	„ G. Mahadeva Aiyar, B. A. (Hons.)
	„ M. R. Balakrishna Wariyar, B. A. (Hons.)
Lecturers.	Mr. T. C. Mathew, B. A. (Hons.) Madras, B. A. (Hons.) Oxon (on leave.)
	„ E. P. Narayana Pillai, B. A. (Hons.) (Madras) B. A., (Hons.) Oxon Acting.
	Sry. K. Easwari Amma B. A. (Hons.)
	Mr. K. N. Vasudeva Panicker, B. A. (Hons.)
	„ S. Jathayavageswara Aiyar, B. A. (Hons.)
	„ P. C. Varki, B. A. (Hons.) Acting.
	„ G. Sankaranarayana Aiyar, B. A. (Hons.) Acting.

*History and Economics.*

Professors.	Mr. T. Damodaran Nambisan, B. A. (Hons.) Acting.
	„ V. Narayana Pillai, B. A. (Hons.) B. L. Acting.
Assistant Professors	Sry. K. Saradamma B. A. (Hons.) Dip-in-Edn. Acting.
Lecturers	Mr. K. Mammen B. A. (Hons.) Acting.
	„ K. Palpu Pillai, M. A., Hons. (Madras), B. A. (Oxford.)
	„ V. R. Pillai, M. A., M. Sc., (Econ.) Acting.
	„ R. N. Poduval, B. A. Hons. M. Sc., (Econ.), Ph. D. Acting.

LANGUAGES OTHER THAN ENGLISH.

*Sanskrit Department.*

Superintendents of Studies in Sanskrit.	Mimamsakaratna V. A. Ramaswami Sastri, M. A.
Lecturers.	Mr. V. Sankara Iyer, M. A., L. T., Acting.
	„ V. Venkitarama Sarma, Mahopadhyaya.
	„ K. Sivaramakrishna Sastri (Acting.)
	„ A. G. Krishna Warriar M. A. (Acting.)

*Malayalam Department.*

Superintendents of Studies in Malayalam.	Dr. K. Goda Varma, M. A., Ph. D.
Lecturers.	Mr. N. Kunjuraman Pillai, M. A., B. L. (Acting.)
	Sry. K. Meenakshi Amma, M. A.

Lecturer	Mr. C. I. Gopala Pillai, M. A.
Junior	„ P. N. Kunjan Pillai, B. A. (Hons.) (on other duty.)
Lecturers.	„ C. Narayana Pillai, M. A. (Acting).
	„ N. Raman Pillai, M. A.
	„ N. Kunjukrishna Pillai, M. A. (Acting.)

*Tamil Department.*

Lecturer	„ C. Pannirukaiperumal Mudaliar, M. A., B. L.
Junior.	„ A. S. Muthiah Mudaliar, M. A.
Lecturer.	
Part time.	„ Rev. Fr. Engelbert.
Tutor in	„ Cecil Naire B. A. (Temporary) (On War Service.)
French.	
Lecturer in	„ T. P. Tampy, B. A.
French.	
	„ K. N. Parameswara Panikkar, B. A. R. B. Visarad.
	Temporary Junior Lecturer in Hindi.
Lecturer in	„ K. Muhammad M. A. (Temporary.)
Arabic.	

*Philosophy Department.*

Professor.	Mr. V. Sundararaja Naidu, M. A., B. L. (Acting.)
Lecturers.	Mr. K. C. Mathew, F. A. (Hons.)
	„ A. S. Narayana Pillai M. A., M. Litt. (Temporary),

*Mathematics Department.*

Professors.	Mr. R. Srinivasan, M. A. (Ag. Principal on leave)
	Dr. H. Subramonia Aiyar, M. A. Ph. D.
Assistant	Mr. C. V. Subbarama Aiyar, B. A. (Hons.)
Professors.	Dr. U. Sivaraman Nair, M. A., Ph. D. (London.,
	Mrs. Annamma Varki, B. A., (Hons) Acting.
Lecturers.	Mr. S. Thanoo Aiyar, M. A. (Hons.)
	„ P. Harihara Aiyar, B. A. (Hons.)
Temporary	Mr. K. Balachandran Nair, B. A., (Hons.)
Junior	„ S. Parameswara Aiyar, B. A. (Hons.) (Acting)
Lecturers.	„ K. Sankara Pillai, B. A. (Hons.) Do.

*Physics Department.*

Professor.	Mr. V. Sivaramakrishna Aiyar, M. A.
Assistant.	„ M. S. Rama Aiyar, M. A., L. T.
Professors	Mrs. Mary Poonen, B. A. B. Sc., A. R. J. S.
	Mr. P. K. Krishna Pillai, B. A. (Hons.) (Temp.)
Lecturers.	„ N. A. Nilakanta Aiyar, M. A.
	„ M. V. Chacko, B. A. (Hons.)
	Dr. T. T. Thomas, M. A. Ph. D., F. P. S. A., Inst. P.
	(on leave.)

Lecturer.	Mr. S. Sitharama Aiyar, B. A. (Hons.)
	„ P. V. Ramaswamy Aiyar B. A. (Hons.)
	„ S. Gopala Menon M. A. (Ag.)
	„ C. Joseph M. A. (Ag.)
	„ S. Hariharan M. A. M. Sc., (Temp.)
	„ M. Martin Nathanial, B. Sc. (Hons.) (Temp. Junior Lecturer,)

### *Chemistry Department.*

Professor.	Mr. K. R. Krishna Aiyar, M. A. (Acting.)
Assistant	„ A. Narayanan Poti, M. A. Do.
Professors.	„ A. Venkitachalam Aiyar, M. A. (Temporary.)
Lecturers.	„ Ittyerah Joseph M. A., A. I. I. Sc.
	„ E. T. Mathew, M. A.
	Dr. P. Parameswaran Pillai, B. A., D. Sc.
	A. I. Sc. A. I. C.
	Mr. N. Chidambaram M. A. (Ag.)
	„ K. Madusudan Pandalai, M. Sc., Ph. D., A. I. C.
	(Temporary.)
	„ C. Balasubramoniam B. Sc. (Hons.) Do.
	„ R. Ramachandra Aiyar, M. Sc. Do.

### *Botany Department.*

Professor.	Dr. T. K. Koshy, M. A., Ph. D. F. R., M. S. F. L. S.
Assistant	Mr. J. Srinivasan M. A.
Professor.	
Lecturers.	„ K. Narayana Aiyar, M. A.
	„ Russel Solomon, M. Sc.

### *Zoology Department*

Professor.	Dr. C. C. John M. A. DSc. D. I. C.
in charge.	
Assistant	Mr. Eapen Ittyerah M. A. (Acting.)
Professor	
Lecturers.	„ A. P. Mathew, M. A.
	„ K. Bhaskaran Nair, B. A. M. Sc. (Ag.)
	„ T. P. Vis vanathan, B. Sc. (Hons.)

### *Physical Training.*

	Mr. P. J. Joseph, B. A. Diploma in Physical Education
	(Madras) (Acting)
	„ V. G. Abraham B. A. (Temporary) (on War Service).
	„ K. Raghava Varma, B. A. Temporary.
	„ S. Perimbamuthu, B. A. Acting.

**Rules for the constitution and working of the Council of  
His Highness the Maharaja's University College,  
Trivandrum, framed under Section 9 of  
Chapter XV of the Statutes.**

1. The College Council shall consist of the Principal, the Professors and the Superintendent of Studies in Indian Languages of the College. The Director of Research shall be a member of the council and may ask for his opinion to be recorded but he shall not exercise a right to vote.

2. The Principal shall be the President, ex-officio, of the Council. The Council shall appoint one of its members as the Secretary. The member so appointed shall hold office for one year, but shall be eligible for re-election.

3. The general administration of the College shall vest in the Principal, subject to the control, in the first instance, of the Pro-Vice-Chancellor, (when there is no Pro-Vice-Chancellor, of the Vice-Chancellor) and ultimately, of the Syndicate. Some of the general administrative work of the College may be distributed by the Principal among the members of the Council with their concurrence to be done under the general supervision of the Principal, e. g., Library, Athletics, maintenance of buildings and grounds etc.

4. The Council is empowered to consider and report on any question concerning the College whether as regards accommodation, courses of instruction or discipline; but it shall not interfere with the general administration of the College except when such authority is entrusted to it by the Principal.

5. All questions of promotion, term certificates, and scholarships shall be decided by the Council.

6. All cases of serious misconduct on the part of students involving the loss of their term certificates or their removal or expulsion from the College shall be dealt with by the Principal, ordinarily, in consultation with the Council.

7. Meetings of the Council shall be convened at such time as the Principal may consider necessary. He shall also convene a meeting when required to do so by the Pro-Vice-Chancellor or on the written requisition of not less than two of the members.

8. It shall be the duty of the Secretary to give notice of the meetings of the Council, to keep a report of the proceedings of such meetings and to forward, through the Principal, a copy of the proceedings to the Registrar.

9. Not less than three clear days' notice of a meeting shall ordinarily be given to each of the members. The notice shall be accompanied by an agenda paper showing the business to be transacted at the meeting together with any papers that may be necessary for reference.



10. The President, or in his absence, the Professor in charge, shall take the chair at the meetings of the Council.

11. Not less than a majority of the members shall form a quorum and all questions shall be decided by a majority of the votes of the members present. If the votes, including the vote of the Chairman, are equally divided, the Chairman shall have a casting vote. The Principal may overrule the decision of the College Council; but in such cases, he shall make a report to the Pro-Vice-Chancellor setting forth his reasons for doing so.

12. The Chairman shall be sole judge on any point of order. He may call any member to order and shall have power to take such action as may be necessary to enforce his decision.

13. The Principal shall have charge of the office records and correspondence of the College. The members of the Council shall have access to these during the days and hours to be fixed by the Principal, provided, however, that no member shall have access to confidential records, or correspondence without the special permission of the Principal.

14. The Budget shall be framed by the Principal in consultation with the Council and forwarded to the Registrar.

15. Notwithstanding anything contained in the foregoing rules, it shall be competent to the Principal to dispose of any matter which should ordinarily be disposed of by the Council, but which in his opinion is of so emergent a nature that it cannot be put off. Action taken by the Principal under this rule should be reported to the Council as soon as possible.

### III. His Highness the Maharaja's College for Women, Trivandrum.

1. *Historical Sketch.* This institution, originally a school for Christian girls, was taken over, recognised and opened to all castes by the Travancore Government in 1864 from which date it was known as the Sirkar Girls' School. It was recognised as a High School by the University of Madras in 1890.

In 1895 it was reorganised with an increased staff under the name of H. H. the Maharaja's High School for Girls, and on the institution being affiliated as a Second Grade College in January 1897, the designation was changed to H. H. the Maharaja's College for Girls.

Training classes for teachers were opened in January 1904, and continued to be attached to the College till the end of 1920, when they were separated from the College and accommodated in a building of their own. In June 1931 the High School also was separated from the College and now the College works alone under its new name, H. H. the Maharaja's College for Women. The present buildings were occupied in June 1923.

In July 1928, the College was further affiliated in Natural Science of the Intermediate Course and in the B. A. Degree Course in Part I English Language and Literature, and Part II. Group IV A—History and Economics and Group V—Malayalam and Sanskrit. In July 1929 further affiliation was obtained in Indian Music of the Intermediate Course and in group (i-b) Mathematics with Astronomy and Analysis, as special subjects of the B. A. Degree Course. The B. A. Degree Course was suspended in June 1937.

2. *Management.* The Administration of the College is vested in the Principal.

3. *Buildings.* The classes are held in four separate buildings which provide 29 separate rooms (including a College Hall and Reading lounge) for class purposes and laboratories, 2 office rooms 2 Halls for Library and 4 retiring and common rooms for teachers. There are separate tiffin sheds. The College stands on a ground of about 5 acres.

4. *Hostels.* The College Hostel was opened in 1921. Besides the Warden there is one resident tutor who is a member of the College staff. There is also a medical officer attached to the Hostel.

Accommodation is also provided for the residence of students of the College in the Y. W. C. A. Hostel, the S. N. V. Sadanam, the Hindu Vanita Sangham Hostel, the Holy Angels' Convent Hostel, the Zenana Mission Hostel, and the Bethany Hostel.

5. *Courses of study.* Provision has been made for instruction in the following subjects under Part III of the Intermediate Course :—

Mathematics, Physics, Chemistry, Biology, Ancient History, Modern History, Indian History, Logic, and Indian Music.

Malayalam, Tamil, Sanskrit, Hindi and French are taught under Part II.

6. *Endowments—Scholarships, Prizes etc.*

(a) *Scholarships.* His Highness the Maharaja's Scholarships to subjects of His Highness the Maharaja—One Scholarship of the value of Rs. 11½ per mensem awarded on the results of the Intermediate Examination to the best student of the College who joins the College of Science or the College of Arts for her B. A. or B. Sc. Pass or Honours Course.

Two Scholarships of Rs. 7½ each per mensem tenable in the Intermediate classes for two years to the best students of H. H. the Maharaja's English High School for Girls who join this College for their Intermediate Course.

A certain number of open scholarships of the value of Rs. 7½ per mensem tenable in the Intermediate Class, for two years awarded on the results of the E. S. L. C. Examination.

Close scholarships of the value of Rs. 7½ per mensem tenable in the Intermediate Classes awarded to students belonging to the backward communities on the results of the E. S. L. C. Examination. The number is fixed by the University of Travancore.

Four Lady Willingdon Scholarships of the monthly value of Rs. 15 each awarded to the four best students of this College who are subjects of H. H. the Maharaja, who join the Queen Mary's College, Madras, or the Presidency College, Madras, or one of the Government Colleges in Trivandrum for their B. A. or B. Sc. Pass or Honours Course.

One Hodgson Memorial Scholarship for Women of the value of B. Rs. 132 per annum awarded for study in the Intermediate and B.A. Pass or Honours Courses to a woman student who is in a Travancore College and who is in need of monetary help for her College course : tenable for four or five years, according as the student takes the B. A. Pass or Honours Course.

Three Thankamma Memorial Scholarships to poor and deserving Nair Girls, tenable for courses of study in H. H. the Maharaja's English High School for Girls, Trivandrum and subsequently in a College. The amounts are fixed at Rs. 5 per mensem in High School classes, Rs. 10 in the Intermediate classes and Rs. 15 in the B. A. classes.

Rajagopalachari Ammukutti Scholarships awarded to Nair students who join this College for their Intermediate course. There are two scholarships one in the Junior Intermediate, and the other in the Senior Intermediate. The Scholarships will be of the value of B. Rs. 10 per mensem.

(b) *Medals and prizes*:—K. V. Natesa Aiyar's Sethu Lakshmi Bai Maharani Regent Medal, of the value of about B. Rs. 50 awarded annually in this College to the student who passes highest from the college for the Intermediate Examination after the minimum period of study and in the first year of her appearing for the examination.

Muthamma Muthunayakam Gold Medal in music—

Maharani of Bikanir Prize in music—

7. *Rates of fees.* The college fee rates are as follows:—

For the Intermediate course S. Rs. 84 (eighty-four) only per annum.

		Rs.
For Part I only	...	28
For Part II only	...	14
For Part III only	...	42
Library fee S. Rs. 2 (two) only.		
Athletic fee S. Rs. 2 (two) only.		
Stationery fee S. Re. 1 (one) only.		
Health service fee S. Re. 1 (one) only.		

**Laboratory fee :—**

	Rs.
<b>Intermediate course</b>	
Mathematics, Physics and Chemistry ...	5
Physics, Chemistry and Biology ...	7
Mathematics, Physics and Indian Music ...	2
Biology, Chemistry and Indian Music ...	5
<b>8. Numerical strength, (1942-43).</b>	
<b>Junior Intermediate.</b>	
Mathematics, Physics, Chemistry ...	34
Mathematics, Physics, Indian Music ...	2
Physics, Chemistry, Biology ...	68
Biology, Chemistry, Indian Music ...	11
Biology, Chemistry, Logic ...	24
Ancient History, Modern History, Logic ...	32
Ancient History, Modern History, Indian Music ...	8
Ancient History, Modern History, Indian History ...	15
<b>Senior Intermediate.</b>	
Mathematics, Physics, Chemistry ...	22
Mathematics, Physics, Indian Music ...	2
Mathematics, Physics and Logic ...	1
Biology, Chemistry, Indian Music ...	7
Biology, Physics, Chemistry ...	30
Biology, Chemistry and Logic ...	19
Ancient History, Modern History and Logic ...	19
Do. Do. Indian Music ...	5
Do. Do. Indian History ...	4

9. *Library.* The College has a well equipped Library containing about 12457 volumes. Additions are made every year. Liberal grants are expended for the purchase of periodicals.

10. *Physical Education.* A qualified Physical Instructress is in charge of the physical education activities of the students. Arrangements have been made for the following games :—Net-Ball, Base-Ball, Badminton, Tennis, Volley Ball and Tennikoit.

11. *Corporate life.* There are several associations doing useful work, such as the Arts Club, the Debating Club, the Malayalam Club, the Science Club, the Sports Club, Tennis Club, the Tamil Club and the Hindi Association.

### 12. Staff of the College.

1. Miss Anna Nidiry M. A., (Hons.) Ag. Lady Principal.
2. Mrs. Annamma Varki B. A., (Hons.) Assistant Professor,  
Mathematics. (on other duty)
3. Sry. B. Anandavalli Amma B. A., (Hons.) Lecturer, English.
4. „ C. Rukmini Amma B. A., (Hons.) „ History.
5. Mrs. Rebecca Thomas Philip B. A., (Hons.) „ Logic.
6. Sry. V. K. Karthiyani Amma B. A., (Hons.) „ Sanskrit.
7. Mrs. Lakshmykutty Narayanan Nair M. A., „ Indian Music.
8. Miss F. Martin M. A., „ French.
9. Sry. T. J. Ponnamma M. A., Junior Lecturer, Malayalam.
10. „ K. Parvathi Amma M. A., Lecturer, Chemistry.
11. Mr. S. Gopala Menon M. A., Do. Physics. (on other duty.)
12. Mrs. M. E. Gram M. A., L. T. Lecturer, Physical Education.
13. Miss Sosa P. John M. A., „ Natural Science.
14. Mrs. Mariam Paul M. A., Jr. „ Do.
15. Sry. K. Sarada B. A., M. Sc. „ Chemistry.
16. Miss P. Jesudasan M. A. „ Physics.
17. Mrs. S. Rosammal B. A., L. T., Lecturer, Tamil.
18. Mrs. Sara Kurien B. A., M. Sc., Jr. Lecturer, Chemistry.
19. Miss D. P. Muthunayagom B. A., (Hons.) do. English (Ag.)
20. Miss Elizabeth Kurien M. A. Jr. Lecturer, Physics.
21. Miss Annamma Cherian M. A., Jr. Lecturer in Physics (Ag.)
22. Miss Helen Joseph, B. A., (Hons) Jr. Lecturer in English  
(Temporary)
23. Miss Janet R. Joshua M. A., Junior Lecturer in Hindi  
(part time)

### IV. His Highness the Maharaja's Sanskrit College, Trivandrum.

1. *History of the Sanskrit College.* The institution was started in 1889. Instruction was originally imparted in Veda, Kavya and the Sastra Branches of Study. The management of the Veda Section was from 1110 transferred to the Devaswam Department. Till 1094 the College was housed within the Fort and the students, only Brahmins, were all given free boarding. Later, free boarding was discontinued and scholarships were awarded instead.

The courses of studies were re-organised in 1917 and the College was placed under a graduate Principal conversant with Sanskrit and English, and was made accessible to all classes of people. The College continued to work as per the re-organised scheme till its affiliation to the University of Madras in 1936. Instruction according to the Siromani courses of the Madras University was provided till March 1941.

The College at present provides instruction for the Sanskrit Entrance Examination and the Mahopadhyaya Courses of the Travancore University.

The branches in which instruction is, at present, imparted are as follows;—

<i>Mahopadhyaya</i> :	I class,	Vyakarana, Sahitya, Tarka and Jyotisa.
Do.	II „	Vyakarana and Sahitya.
Do.	III „	Vyakarana and Sahitya.
Do.	IV „	Sahitya and Tarka.

The Jyotisa branch was renewed during the year 1117. The opening of the Vedanta and Mimamsa branches for the Mahopadhyaya Examination is under contemplation.

2. *Rules of Admission.* Admission to the Sanskrit Entrance class is given only to those who have passed the Sastri Test Examination conducted by the Travancore Government.

Admission to the Mahopadhyaya I class is given to those who have passed the Sanskrit Entrance Examination of this University or the Sanskrit Entrance Examination conducted by the Madras Government.

3. *Scholarships, Medals and Prizes.* Five Scholarships of Rs. 7½ each per mensem are awarded annually on the basis of merit, to the students of the Siromani IV class and fifteen scholarships of Rs. 5 each per mensem are distributed equally, on the basis of merit, to the students of the remaining College classes other than the Entrance class.

Dewan Rama Row Sanskrit College Prize. The interest accruing from the endowment of the value of Rs. 600 is placed at the disposal of the Principal, Sanskrit College, for awarding a prize in the form of suitable books to the candidate who gets the highest rank amongst those presented from the College for the final University Examination, viz., Mahopadhyaya.

4. *Statement of Strength.*—(1942-43.)

Entrance class	36
Mahopadhyaya I class Sahitya 8,	
Tarka 3, Vedanta 4	15
Do. II class Vy. 4, Sahitya 7, Tarka 3,	
Jyotisa 2	16
Do. III class Sahitya 5, Vy. 15	20
Do. IV class Sahitya 7, and Vy. 6	13
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### 5. *Members of the Staff.*

Mr. N. Gopala Pillai M. A.	Ag. Principal.
„ S. Venkitakrishnan B. A. (Hons.)	English Teacher (On other duty)
„ P. Rajamma M. A.	Do. Acting
„ T. Raghavendrachariar	Nyaya Pandit
„ A. Parameswara Sastrigal	„ „
„ S. Parameswara Sarma, Vyakarana and Mimamsa	„ „
„ K. Ramakrishna Sastrigal	Jyotisa „
„ N. Padmanabha Panickar	Vyakarana „
„ S. Neelakanta Sastri	Nyaya „
„ Ravi Varma Tampan	Vyakarana „
„ K. Mahadeva Sastri	Nyaya „
„ M. Sivasubramonia Sastri	Vyakarana „
„ K. Yegnanarayana Sarma	Vyakarana „
„ V. Ramasarma	Tarka „

His Highness the Maharaja's Training College, Trivandrum.

1. *Historical Sketch.* The Government Normal School, Trivandrum was founded in the year 1895. Teachers who had passed the F. A., Matriculation, or Vernacular Examinations were trained in this institution till 1911 in which year the Normal School was converted into a Teachers' College. From that date both graduates and undergraduates are being trained in this institution.

From the year 1934—35. the strength of the L. T. section was raised from 50 to 80. Non-stipendiaries (private students *i. e.* those not employed as teachers in recognised schools in the State) are admitted on condition that their numbers in each year should not be so large as to shut out the chances of untrained graduates in departmental and private schools. Only those who have obtained at least a second class in the B. A. Degree Examination are admitted as non-stipendiaries.

The Silver Jubilee of the College was celebrated on the 8th and 9th April 1937. The College has attached to it a Model School containing classes 1 to 4 and from the Preparatory class to the VI Form.

2. *Buildings.* The College building is a T-shaped two-storeyed structure in which the College classes, the Library, the Educational Bureau and Museum and the Model School classes from Form I upwards are housed. The Preparatory class and primary classes are held in a separate building. The Geography section of the college is temporarily housed in the building adjacent to the Assembly Hall called the "Principal's quarters."

3. *Course of study etc.* Graduates are prepared for the L. T. Degree Examination of the Travancore University. Undergraduates

in which class are included those who have passed the Intermediate Examination of the Travancore University or the English School Leaving Certificate Examination of the Travancore Government, who are eligible for service as teachers in the State, are trained as teachers for the Middle Schools.

Graduates and Undergraduates undergo training for one year.  
Subjects for which provision has been made :—

<i>Course.</i>	<i>Subject.</i>
L T	(a) English.
	D (2) (b) Mathematics.
	D (2) (c) Physical Science.
	D (2) (d) Natural Science.
	D (2) (e) History.
	D (2) (f) Geography.

4. *Admission of candidates.* Admission to the College will be made by the Principal in consultation with the Pro-Vice-Chancellor and the Director of Public Instruction. The Principal has the power to send away any non-stipendiary student who appears to him during the first 50 days as not likely to prove an efficient teacher ; in the case of stipendiaries, the Principal can report such cases for action, to the employers concerned.

5. *Stipends.* Teachers from departmental schools who are under training will receive as stipend their substantive pay which they were drawing immediately before their deputation or the amount fixed under rule 186 of the Travancore Education Code i. e. Rs. 30 for Graduates and Rs. 15 for Undergraduates whichever is greater. Teachers recruited after 1st April 1934 to schools in the State (both departmental and private) are not entitled to any stipend or stipend grant.

*Stipends grant.* Managers of private schools are given a grant of half the stipend they pay to the teachers selected from their schools, provided the teachers entered service prior to 1st April 1934. The grant is however limited to a maximum of Rs. 17½ and Rs. 8½ in the case of Graduates and Undergraduates respectively.

6. *Fee Rules.* The Rules of fee in the Training College are as follows :—

- (a) L. T. Course—S. Rs. 150 and S. Rs. 200 per Academic year.
- (b) Undergraduate Training Course—S. Rs. 60 per year.
- (c) Athletic fee for Graduate students S. Rs. 4 per year.
- (d) Do. for Undergraduate students S. Rs. 1½ per year.
- (e) Manual Training fee for Graduate Students—S. Re. 1.

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\* Fee for students from outside the State.



Poor Mahomedan students and students of the back-ward classes who are not stipendiaries are given fee concession in respect of tuition fee alone.

7. *Strength.* The strength of the L. T. section is fixed at 80 and that of the Undergraduate section at 50.

8. *Endowments.* The Shashthyabdapurthi Gold Medal founded in honour of the 60th Birthday of H. H. the late Maharaja of Travancore is given every year to the student of the College who has done best in his year.

9. *Library.* The Library contains about 11,428 books of educational and general interest. The students and staff of the College have also the use of the Educational Bureau and Museum of which the Principal is the ex-officio Head. It contains over 16,747 books which are lent to *bona fide* teachers in the State.

10. *Physical Education.* The College has provision for Tennis, Badminton, Volley ball, Hockey, Foot-ball, Basket-ball, Tennikoit and Cricket. These games are organised by the College Athletic Club.

11. The Training College Teachers' Association is open to all the students of the College and the instructional staff of the Training College and the Model School. Student members pay a subscription of 8 annas per year.

## 12. *Staff of the College.*

Principal	Mr., A. Narayanan Tampi, B. A. Bar-at-Law (Inner Temple), Diploma in Education (on other duty) Dr. D. Jivanayakom M. A., L. T., Ph. D. (Acting)
Lecturers (1st grade)	Dr. D. Jivanayakam, M. A., L. T., Ph. D., (on other duty) Mr. A. Chumar, M. A., L. T. Mr. K. Sankaranarayana Aiyar, M. A., L. T. (ag) Mr. P. S. Abraham, B. A., M. Ed. (ag) Mr. S. Muthukrishna Karayalar, B. A., L. T., B. A. (Hons.) F. R. G. S.
Lecturer (2nd grade)	Mr. P. G. Sundara Iyer, M. A., L. T. Mr. N. S. Krishna Pillai, M. A., L. T., (ag)
Drawing Master	Mr. K. Ramakrishnan Asari.
Instructor in Physical Training.	Mr. Thomas Jacob, B. A., Diploma in Physical Education (acting). (on war service) Mr. N. Parameswara Menon, B. A., Diploma in Physical Education (acting).

**VI. His Highness the Maharaja's Law College,  
Trivandrum.**

1. *Historical Sketch.* In 1894 the Travancore Law Class which was opened in 1875 and affiliated to the Madras University, was raised to the status of a College. It prepared students for the Pleadership Examination of the Travancore Government and the B. L. and M. L. Degree Examinations of the Madras University. In June 1902 the old rules relating to the constitution and working of the Law College were revised by the Travancore Government by which the general management of the College was vested in the Principal, subject to the control of the Dewan, the Law College Council being thus abolished. In January 1909, a slight modification was made by placing the Law College under the Director of Public Instruction. This arrangement was altered in April 1910 when it was placed under the control of the High Court.

The College was made a full time institution with effect from the beginning of the academic year 1931-32, a College Council also being instituted at the same time. The Pleadership classes which were suspended in 1933 were abolished subsequently.

2. *Administration.* The general management of the College is in the Principal. There is a Council composed of the Principal and other members of the teaching staff to advise and assist the Principal, in the internal administration of the College. The Principal is ex-officio President of the Council.

A Board called the Law College Advisory Board has been constituted for the purpose of advising the University on all matters relating to the College. It consists of :—

1. The Chief Justice of the High Court of Travancore (President-ex-officio).
2. The Dean of the Faculty of Law (ex-officio).
3. A Judge of the High Court of Travancore nominated by the Vice-Chancellor.
4. The Advocate-General of Travancore (ex-officio).
5. & 6. Two members nominated by the Vice-Chancellor, one of whom at least shall be a member of the Bar.
7. The Principal of the Law College (Secretary ex-officio).

It shall be competent to the Law College Advisory Board to make any recommendation to the University relating to the affairs of the College either on its own motion or on a reference made to it.

There shall be an ordinary annual meeting of the Board in March every year.

3. *Buildings.* The Law College had no separate building of its own till 1916. Till then it occupied certain rooms on the first floor of the School of Arts. The accommodation thus provided being insufficient, Government in 1912, sanctioned the construction of a separate building for the Law College. The new building was completed and occupied in 1916.

4. *Courses of instruction.* The Law College is an institution forming part of the University and is intended to afford instruction to students preparing for the B. L. and M. L. Degree Examinations of the University. The courses of instruction for the degree of Bachelor of Laws shall extend over two years, divided into six terms, the terms, being separated by the three vacations of the year. During the first three terms students shall be prepared for the First Examination in Law and during the remaining three terms, students who have passed the F. L. Examination shall be prepared for the B. L. Degree Examination. There is no regular course for the M. L. Degree Examination, but students who join the College have access to the Library and are given general direction and guidance concerning their work.

5. *Endowments, Scholarships and Prizes.* Four prizes and one medal are awarded annually. The "Cullen Prize" of Rs. 58 is awarded to the Travancore student in the Trivandrum Law College, who passes highest in the M. L. Degree Examination, and if there are no M. L.'s, to the student who passes highest in the B. L. Degree Examination; the "Sadasivan Pillai Law Prize" of Rs. 40 to the student who, being a subject of His Highness the Maharaja of Travancore, passes highest at the examination for the degree of Master of Laws or Bachelor of Laws of the University, and who does not get the Cullen Law Prize, preference being given to the candidate who passes the M. L. Degree Examination when there are both B. L. and M. L. candidates in the same year; the "Mr. Justice Muthunayagom Memorial Prize" of books for the amount accruing as interest from the fund, awarded annually to the first-year student of the Trivandrum Law College, who appearing for the F. L. Examination of the University held immediately after the completion by him of the F. L. Course passes highest in that examination from the College; and the "Justice Kunhi Raman Nair Gold Medal," awarded every year to the Nair student of the Trivandrum Law College, who appearing for the B. L. Degree Examination of the University held immediately after the completion by him of the B. L. Course passes highest in that Examination. Sachivothama Shashtiabdarupurthi Memorial Prize of Books or Cash shall be awarded annually to a student who being a subject of H. H. the Maharaja of Travancore, passes highest in the First Examination in Law of the University after the minimum course of study for the examination. The value of the

Prize shall be determined from time to time by the Syndicate, but shall not exceed the annual interest on the endowment.

6. *Rate of fees.* The tuition fee is S. Rs. 160 per year for the B. L. class and the F. L. Class.

7. *Strength.* F. L. Class 112.  
(1942-43) B. L. Class 83.

8. *Library.* There are about 5000 volumes in the Library.

9. *Corporate life.* The Law College Association consists of ordinary and honorary members. It seeks to afford facilities to members to discuss legal questions and other topics of general interest, to hear lectures delivered by persons invited for the purpose and to promote *esprit de corps* between the past and the present students of the College. The Association may appoint Secretaries or Captains directly responsible to the Managing Committee for the purpose of encouraging such games as Tennis, Foot-ball, Volly-ball, Basket ball, Ping Pong, Badminton, Hockey, Cricket, etc. A Magazine is published under the auspices of the Association.

10. *Staff of the College.* The teaching staff now consists of a Principal, two Professors and three Part-time Lecturers.

Principal Mr. K. P. Padmanabha Pillai, B. A., LL. B.  
Barrister-at-Law.

Professors. Mr. H. Ganapathi Iyer, M. A., M. L.  
Mr. K. Narayanan, B. A., B. L.

Part-time Lecturers, Mr. V. I. Joseph, B. A., B. L.  
Mr. V. N. Subramonia Iyer, M. A., M. L.  
Mr. P. S. Atchuthan Pillai, M. A., M. L.

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Rules for the constitution and working of the Councils of His  
Highness the Maharaja's Law College and His  
Highness the Maharaja's Training College  
framed under Section 9 of  
Chapter XV of the  
Statutes.

1. The College Council shall consist of the Principal, the Professors and the lecturers in H. H. the Maharaja's Law College, Trivandrum. In the case of the Training College the Principal and the lecturers will constitute the College Council.

2. The Principal shall be the President, ex-officio of the Council. The Council shall appoint one of its members as the Secretary. The member so appointed shall hold office for one year, but shall be eligible for re-election.

3. The general administration of the College shall vest in the Principal, subject to the control, in the first instance, of the Pro-Vice-Chancellor, (when there is no Pro-Vice-Chancellor, the Vice-Chancellor) and ultimately, of the Syndicate. Some of the general administrative work of the College may be distributed by the Principal among the members of the Council with their concurrence to be done under the general supervision of the Principal, e. g., Library, Athletics, maintenance of buildings and grounds, etc.

4. The Council is empowered to consider and report on any question concerning the College whether as regards accommodation, courses of instruction or discipline; but it shall not interfere with the general administration of the College except when such authority is entrusted to it by the Principal.

5. All questions of promotion, term certificates and the award of scholarships, prizes and medals shall be decided by the Council.

6. All cases of serious misconduct on the part of students involving the loss of their term certificates or their removal or expulsion from the College shall be dealt with by the Principal, ordinarily, in consultation with the Council.

7. Meetings of the Council shall be convened at such time as the Principal may consider necessary. He shall also convene a meeting when required to do so by the Pro-Vice-Chancellor or on the written requisition of not less than two of the members.

8. It shall be the duty of the Secretary to give notice of the meetings of the Council, to keep a report of the proceedings of such meetings and to forward, through the Principal, a copy of the proceedings to the Registrar.

9. Not less than three clear days' notice of a meeting shall ordinarily be given to each of the members. The notice shall be accompanied by an agenda paper showing the business to be transacted at the meeting together with any papers that may be necessary for reference.

10. The President, or in his absence, the Senior in charge, shall take the chair at the meetings of the Council.

11. Not less than a majority of the members shall form a quorum and all questions shall be decided by a majority of the votes of the members present, if the votes, including the vote of the Chairman, are equally divided, the Chairman shall have a casting vote. The Principal may overrule the decision of the College Council; but in such cases, he shall make a report to the Pro-Vice-Chancellor setting forth his reasons for doing so.

12. The Chairman shall be sole judge on any point of order. He may call any member to order and shall have power to take such action as may be necessary to enforce his decision.

13. The Principal shall have charge of the office records and correspondence of the College. The members of the Council shall have access to these during the days and hours to be fixed by the Principal, provided, however, that no member shall have access to confidential records or correspondence without the special permission of the Principal.

14. The Budget shall be framed by the Principal in consultation with the Council and forwarded to the Registrar.

15. Notwithstanding anything contained in the foregoing rules, it shall be competent to the Principal to dispose of any matter which should ordinarily be disposed of by the Council, but which in his opinion is of so emergent a nature that it cannot be put off. Action taken by the Principal under this rule should be reported to the Council as soon as possible.

#### VII. The College of Engineering, Trivandrum.

The College of Engineering was opened in July 1939. It provides instruction for Degree, Diploma and Certificate Courses in :—

- (i) Civil Engineering,
- (ii) Mechanical Engineering, and
- (iii) Electrical Engineering.

The College is housed in the Buildings formerly used for the Office of the Chief Engineer to Government.

The College Workshops form part of the Central Workshops of the P. W. D. and include Machine Shop (Metal and Wood) Fitters' and Erectors' Shops, Carpenters' and Pattern-makers' Shop, Foundry and Smithy and Electricians' Shop.

#### Strength (1942—1943) and Rate of Fees.

<i>Class.</i>	<i>Number of Students.</i>	<i>Fees.</i>
Degree.	87	Tuition fee of Bh. Rs. 200* per annum Stationery fee of Bh. Rs. 5.
Diploma.	79	Tuition fee of Bh. Rs. 100† per annum, Stationery fee of Bh. Rs. 4.
Certificate.	67	Bh. Rs. 8 per annum.

Athletic and library fees at the rate of Bh. Rs. 4 and Bh. Rs. 2, respectively, per annum, will be levied from each student in the Degree and Diploma Classes.

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\*B. Rs. 250 for non-Travancoreans.

†B. Rs. 100 for non-Travancoreans.

*Games, etc.* Provision is made for Foot-ball, Hockey, Volley-ball and Badminton.

*Staff.*

Principal.	Mr. T. H. Matthewman, M. Eng.
and	M. I. E. E.
Professor of Electrical Engineering.	
Professor of Civil Engineering.	M. R. Ry. Vastuvidyakusla C. Balakrishna Rao Ayl. B., A. B. E.
Professor of Mechanical Engineering.	Mr. D. L. Deshpande B. Sc. (Hons.), M. Sc. (Engineering), A. M. I. E.
Associate Professor of Mechanical Engineering.	Mr. J. W. Chacko.
Lecturer in Mathematics.	Mr. K. C. Chacko, M. A., B. E. (Hons.),
Lecturer in Engineering.	Mr. S. Rajaraman, B. E. (Hons.)
Do.	Mr. V. Sivasankaran Nair, B. A., B. Sc.
Do.	Mr. G. Unnikrishna Menon, B. Sc. (Physics), B. Sc. (Eng.), A. C. G. I.
Do.	Mr. M. P. Mathew, B. Sc. (Eng.)
Do.	Mr. P. C. Eapen, B. Sc.
Do.	Mr. P. R. Ramavarma Raja, B. A., B. E.
Do.	Mr. T. C. George, B. A. B. Eng.
Do.	Mr. M. K. Panicker, L. M. E.
Do.	Mr. S. Chelliah.
Workshop Instructor	Mr. K. T. Thomas, L. M. E. (Hons.)

## COLLEGES ADMITTED TO THE PRIVILEGES OF THE UNIVERSITY.

### 1. Scott Christian College, Nagercoil.

1. *Historical Sketch.* This institution, which was opened in 1819 as a school under the name of "Nagercoil Seminary" gradually developed and became a second grade College in 1893. It is open to students of all classes. In 1942-43 there were 13 women students. The College is managed and maintained by the London Missionary Society.

2. *Buildings.* The college buildings, in a large open compound, are commodious and up-to-date, having been extended in 1912, 1922 and 1926.

There are two Hostels, which can accommodate over fifty students in single rooms, with electric light in each. There is a resident Warden. The situation is a fine compound of about five acres at the top of a hill

about half a mile from the College, adjacent to the house of the Principal. The room rent (including establishment charges) is Rs. 6 per term, and the mess charges (including dhobi, light, etc.) are about Rs. 9 a month.

3. *Courses of study.* The College is at present affiliated in the Intermediate Course as follows :—

Part I. English.

Part II. Sanskrit, Tamil and Malayalam.

Part III. Mathematics, Physics, Chemistry, Biology, Ancient History, Modern History, Logic, Sanskrit, Tamil and Malayalam.

There is a well-stocked Library of over 8,700 volumes.

4. *Scholarships.* The Bayliss-Hacker Scholarship, of Rs. 40 per year for two years, is awarded to a Christian Student from Neyyoor District. The Parker Scholarship (in memory of Rev. G. Parker, Principal, 1900-27), of Rs. 45 a year for two years, is awarded to a student from the associated High School, the Duthie Girls' High School, or the S. L. B. High School, Nagercoil.

5. *Strength and rate of fees.*

Class.	No. of students in 1942-43.	Fee rate per term.
First year ...	130	Rs. 30 plus Rs. 2 for each Science subject and Rs. 1½ for Games
Second year ...	109	

6. *Physical Education.* Ample provision is made for games. Football, Volley-ball, Badminton, Basket-ball and Tennis are played, in addition to less formal games.

7. *College Staff.*

Principal	Mr. G. H. Marsden, M. A. (Hons.), M. R. S. T.
English	„ T. K. Narayana Iyer, M. A., L. T.
	„ A. Zachariah, M. A., L. T.
	„ J. Fenn George, B. A.
	„ S. Narayana Iyer, B. Sc.
Mathematics	„ B. Arumai Raj, M. A.
Physics	„ J. M. Arthur, M. A.
	„ H. D. Moses, B. Sc. (Hons.)
Chemistry	„ R. Krishnamachari, B. A.
	„ S. Narayana Iyer, B. Sc.



Biology	„ A. J. Cherian, M. A.
History	„ A. Vethasiromoni, M. A.
Logic	„ A. Zachariah, M. A., L. T.
Sanskrit	„ R. Panchanadeswara Sastri.
	„ T. S. Sethuraman.
Tamil	„ T. S. Sethuraman.
	„ B. Arumai Raj, M. A.
Malayalam	„ R. Panchanadeswara Sastri.
Physical Director	„ J. Fenn George, B. A., Diploma in Physical Education.
Hostel Resident	
Warden	„ J. Fenn George, B. A.

Each permanent member of the staff is a member of the College Provident Fund, to which the College and the members contribute equally.

## ii. C. M. S. College, Kottayam.

1. *General—Origin and previous history.* English education has been given by the Missionaries of the C. M. S. at Kottayam continuously since 1816. A seminary was opened in that year and conducted by English Missionaries working in conjunction with the authorities of the Syrian Church. It was endowed partly by gifts from England and partly by generous endowment consisting partly of land and partly of funds made by the then Rani of Travancore, Rani Sri Parvathi Bai. In 1837 it was found necessary to divide the endowments. About a half of the total sum was given in trust to the Missionaries at Kottayam for the education of Syrian Christian boys and a new College building was built in that year under the supervision of the late Rev. Henry Baker (senior). Although styled a College, the institution was only a high school. In 1862 the school began to send up candidates for the Matriculation Examination. In 1897 F. A. Classes opened and the institution began its career as a second grade College. In 1909 with the organisation of the Intermediate course a separate block of buildings was erected for the College section and in 1910 the College classes were transferred thither. The College was then affiliated in English, Malayalam, Sanskrit, Mathematics, Physics, Chemistry, Ancient History, Modern History and Logic. In 1923 the College was further affiliated in Natural Science and a spacious hall was added to accommodate the general classes. In 1927 Indian History was added to the subjects of instruction and an additional block of buildings was erected to provide private and common rooms for the staff, and store rooms for Physics, Chemistry, Natural Science and Games.

2. *Management.* The ultimate control of the College rests with the Church Missionary Society in London. The Society has entrusted

the management to a local Governing Board. According to the present constitution this Board consists of 14 members of whom five, *viz.*, the Bishop of the Diocese, the Diocesan Treasurer, the Diocesan representative of the C. M. S., the Principal of the College and the Headmaster of the High School Department are ex-officio, four are elected by the Diocesan Council, one by the staff of the College, two are nominated by the Bishop and the remaining two co-opted by the Board. Besides a general control over the affairs of the College, the Board sanctions the annual budget, determines general lines of policy and looks after the buildings and property of the College. The Principal is the Secretary of the Board.

3. *Finance.* The ultimate financial responsibility for maintaining the College rests with the Church Missionary Society. The current expenses are met from the fee income, the income from the endowments and occasional grant-in-aid for appliances and apparatus from the Travancore Government.

4. *Buildings.* The buildings of the College stand in about 10 acres of land. The main block is built on the top of a hill on a commanding site facing west. It is a two-storeyed building containing laboratories and lecture rooms for Physical, Chemical and Natural Sciences and lecture rooms for Mathematics, History and Logic. A large hall close by and at right angles to the main buildings at the south accommodates general classes in English and Malayalam. At the north end parallel to the hall, is the Staff room block. In 1936 Physics and Chemistry laboratories were extended to accommodate additional students.

The Chapel is a spacious building on the northern side of the compound.

5. *Hostels.* There is a large well-ventilated two-storeyed hostel on the College premises, which provides accommodation for 45 students, and residential quarters for a warden. In addition the College rents a spacious building in the immediate neighbourhood which can accommodate about 15 additional students. There is a separate resident warden for each of the hostels.

6. *Women students.* Fifty-seven women students are studying in both the classes during the current year, of whom 27 are residing in a new hostel about three minutes' walk from the College. The hostel has as its warden a woman member of the staff.

7. *Courses of study.* Intermediate course:—

Part I—English.

Part II—Malayalam and Sanskrit.

Part III—Mathematics, Physics, Chemistry, Biology, Ancient History, Modern History, Indian History and Logic.

8. *Library.* The Library contains about 6,000 volumes classified under the sections Literature, Literary History and Criticism, Shakespeare, Language and Rhetoric, Fiction, etc. An allotment is made each year from the funds of the College for the improvement of the Library. There is also a small hostel library for the use of the hostel residents.

9. *Endowments, Scholarships, Prizes, etc.* The College shares with the high school attached to it an endowment known as the Syrian Trust Endowment which brings in an annual income of about Rs. 6,000. From the endowment provision is made for eight major scholarships in the College at Rs. 36 per annum and four exhibitions at Rs. 80 to Rs. 100 per annum for ex-students of the College who are prosecuting their studies either at Alwaye in Arts or at Madras in Arts, Medicine or Engineering. The scholarships and exhibitions are open for competition to students of Syrian parentage. Besides these there is provision from the general funds for nine educational scholarships and three hostel scholarships. These are open to deserving poor students. In addition to these there are endowments—P. George Memorial Prize, Jacob Chandy Memorial Prize and Mani Memorial Prize—for prizes.

10. *College Societies.* The College Christian Association has been active for many years and social work is carried on in the neighbourhood by students of all communities. Also there is the Literary and Debating Society, the Natural Science Association, Mathematics, Photographic and Touring Clubs.

11. *Miscellaneous.* There are fields for Foot-ball, Hockey, Cricket, and courts for Tennis, Basketball, Volley ball, Sixes and Badminton. There is a graduate member of the staff trained as a Physical Director to look after the physical activities of the men students and a trained Physical Instructor for the women students.

12. *Strength, scale of fees etc. (strength as at the end of 1942-43.)*

Class.	Group.	No. of students.	Rate of fee per year.	Rate of special fee per year.		
			Rs.	Rs.	A.	P.
First year	Science group	126	96 + 12	7	8	0
	History group	48	96	7	8	0
Second year	Science group	104	96 + 12	7	8	0
	History group	24	96	7	8	0

### 13. College Staff;

Principal	The Rev. Philip Lea, M. A.
Lecturer in English	Mr. T. R. Subrahmonia Ayyar, M. A. (Hons.)
Assistant Lecturer „	Mr. P. M. Mathew, B. A. (Hons.)
Lecturer in History	„ T. T. Thomas, M. A.
	„ T. C. Joseph, M. A.
	„ A. G. Varghese, M. A.
Asst. Lecturer „	Vacant.
Lecturer in Physics	Mr. G. M. Thomas, B. Sc. (Hons.)
Asst. Lecturer in Physics	„ P. A. George, B. Sc. (Hons.)
Asst. Lecturer „	„ T. U. Philipose, B. A., M. Sc.
Lecturer in Chemistry	Miss M. Daniel, B. A., L. T.
Demonstrator in Chem.	Mr. S. Pasupathi Ayyar, B. A., L. T.
Lecturer in Biology	„ K. T. George, B. A., B. Sc. (Hons.)
Asst. Lecturer „	
Lecturer in Mathematics	Rev. P. Lea, M. A. (Cantab)
Asst. Lecturer „	Mr. M. Vaithyalingom, M. A.
Asst. Lecturer in Logic	„ C. I. Mathunni M. A.
Lecturer in Malayalam	„ C. I. Raman Nair, B. A.
Tutor in Malayalam	„ V. T. Ipe (part time)
	„ T. I. John (part-time)
Sanskrit and Hindi	„ Padmanabha Sastri (Tutor part-time)
Medical Adviser	Dr. Kurian George, M. B, B. S., D. L.O.
do. for women students	„ Aleyamma Chacko, L. M. P.
Physical Director	Mr. M. P. Abraham, B. A.
do. for women students	Miss A. Chacko, B. A. (part time)
Warden of women students	Mrs. Philip Lea M. A.

### iii. The St. Berchmans' College, Changanacherry.

1. *History of the Institution.* The High School section of the College was started in 1891 by Mgr. Charles Lavigne, S. J. the first Resident Bishop in Changanacherry. Under the regime of His Lordship Rt. Rev. Dr. Kurialacherry, the High School was raised to a Second Grade College. It was affiliated in Group III of the Intermediate course in 1922. In 1925 Groups I and II of the Intermediate course were started. In 1927 the College was raised to the First Grade with Botany main and subsidiary and Zoology main and subsidiary under Part III of the B. A. Degree Pass course. In 1928 Mathematics was started. In 1934 the College was further affiliated in IV—b Economics. The College was originally affiliated to the University of Madras; but since 1938 it has been admitted to the privileges of the University of Travancore.

2. *Management.* His Excellency the Bishop of Changanacherry is the Patron of the College. The present Bishop and Patron is His Excellency Rt. Rev. Mar James Kalacherry, Th. D., D. D. He has vested the management of the College in a Managing Board, consisting of five members of whom the Vicar-General of the Diocese of Changanacherry is the ex-officio president and the Principal of the College is the ex-officio Secretary. The other members are appointed in accordance with the rules given by the Bishop and approved by the University. The following are the members of the Managing board :—

1. Very Rev. Fr. Kuruvillai Plathottathil (Pro-Vicar General), President.

2. Rev. Fr. Romeo Thomas, T. O. C. D., M. A., L. T., (Principal and Secretary.)

3. Rev. Fr. A. C. Eapen, B. A., Ph. D., (Vice-Principal)

4. Rev. Fr. T. N. Siqueira S. J. M. A., Professor of English, St. Joseph's College, Trichinopoly.

5. Mr. P. J. Thomas M. A., B. Litt. (Oxon.), D. Phil. (Oxon.) S. F. R. Econ, M. L. C. Madras, and member of the Senate, University of Travancore.

3. *Buildings.* The College is conducted in a three-storeyed building located in Vazhapally on the M. C. Road from Trivandrum to Ernakulam. A huge block of building has since been added to accommodate the Science Departments.

4. *Hostels.* All students who are not living with their parents or guardians have to reside in one or the other of the following College Hostels or in approved lodges.

1. Sacred Heart's Hostel,

2. St. Thomas' Hostel.

3. St. Joseph's Hostel.

4. St. Berchmans' Hostel,

5. *Courses of study.* The College offers instruction in the Intermediate, B. A., and B. Sc. Degree courses.

Intermediate, Part I—English.

Part II—Malayalam or Sanskrit or Syriac.

Part III—Optionals.

Group I (a) Mathematics, Physics and Chemistry.

(b) Mathematics, Physics and Logic

„ II Biology, Physics and Chemistry.

„ III (a) Modern History, Ancient History and Logic

(b) Modern History, Ancient History and Indian History

Other Combinations :

Mathematics, Physics or Ancient History, and Chemistry or Logic or Indian History.

Biology, Physics or Ancient History and Chemistry or Logic or Indian History.

Modern History, Physics or Ancient History and Chemistry or Logic or Indian History.

B. A. and B. Sc., Degree Classes.

Part I. English.

Part II. Malayalam, Sanskrit or Syriac.

Part III. (a) Science: B. Sc. Degree Course

Group (i) Mathematics.

(v-a) Botany main, Zoology subsidiary.

(v-b) Zoology main, Botany subsidiary.

(b) Arts: B. A. Degree Course.

Group ii-b. Economics main, History subsidiary

## 6. *Scholarships, Medals, etc.*

### Scholarships.

To help deserving students, the college offers 23 scholarships in all, of various types, 15 of which are awarded in the Junior Intermediate class and 8 in the Junior B. A., or B. Sc., class.

#### Intermediate Class :

(i) *General.* (a) Merit scholarships: (1) The Sachivottama Sir C. P. Ramaswami Aiyar Shashtiabdaparthi Memorial Scholarship of Rs. 85 per annum, tenable for 2 years, is to be awarded to a student who is judged, on the basis of the marks obtained in the first sitting in the Travancore E. S. L. C. Examination in the term immediately preceding his admission to the College, to be the first in rank among the students admitted to the University class.

(2)–(7) The Bishop Kalacherry Scholarships, six in number, each of Rs. 45 per annum, and tenable for two years, are to be awarded to six students, who are judged, on the basis of the marks obtained in the first sitting in the Travancore E. S. L. C. Examination in the term immediately preceding their admission to the College to be standing respectively second, third, fourth, fifth, sixth and seventh in rank among the students admitted into the first University class.

#### (b) Poverty Scholarships

##### Intermediate Class :

(1)–(4) Four scholarships, each of Rs. 40 per annum are to be awarded to four students who are judged to be deserving in consideration of their pecuniary circumstances, provided their proficiency in studies is satisfactory as estimated on the basis of the marks obtained in the Travancore E. S. L. C. Examination.

(ii) *Catholic Scholarships*: (1) The Honore Scholarship, of Rs. 85 per annum, tenable for two years is to be awarded to a Catholic student of the first University Class who is judged to be most deserving in consideration of his proficiency in studies estimated on the basis of the marks obtained in the first sitting in the Travancore E. S. L. C. Examination in the term immediately preceding his admission to the College and in consideration of his pecuniary circumstances.

This scholarship may be equally divided between two deserving students.

(2) The Murphy Scholarship, of Rs. 85 per annum, tenable for two years, is to be awarded to a Catholic student of the Diocese of Changanacherry, admitted to the first University class who is judged to be most deserving in consideration of his proficiency in studies estimated on the basis of the marks obtained in the first sitting in the Travancore E. S. L. C. Examination in the term immediately preceding his admission to the College, and in consideration of his pecuniary circumstances.

This scholarship may be equally divided between two deserving students.

(3) The Benziger Scholarship, of Rs. 85 per annum, tenable for two years, is to be awarded to a student duly certified to be of the Diocese of Quilon, who is judged to be most deserving in consideration of his proficiency in studies estimated on the basis of the marks obtained in the first sitting in the Travancore E. S. L. C. Examination in the term immediately preceding his admission to the College, and of his pecuniary circumstances.

This scholarship may be equally divided between two deserving students.

(4) The Bishop Kurialacherry Scholarship, of Rs. 85 per annum, tenable for two years, is to be awarded to the student (or to two students), admitted to the first University class, who is (who are) duly declared to be eligible for scholarship on the basis of the marks obtained in the Changanacherry Diocesan Competition Examination in Religious Instruction for Form VI, in the term immediately preceding his admission to the College.

## II B. A., and B. Sc., Scholarships.

(i) *General*. (a), Merit scholarship. (1) The Sachivottama Sir C. P. Ramaswami Aiyar Shashtiabdapoorthi Memorial Scholarship, of Rs. 112 per annum, tenable for two years, is to be awarded to a student who passes in the first class in the first sitting in the Intermediate Examination of the University of Travancore in the term

immediately preceding his admission to the College and who is judged on the basis of the Intermediate Examination marks, to be first in rank among the B. A., or B. Sc., students admitted to any of the groups of the third University Class.

(2)—(4) The Bishop Kalacherry Scholarships, three in number, each of Rs. 60 per annum, and tenable for two years, are to be awarded to three students who pass in the first class in the first sitting in the Intermediate examination of the University of Travancore in the term immediately preceding their admission to the College and who are judged on the basis of the Intermediate Examination marks, to be most proficient, preferably in each group, among the students admitted to the third University class.

(b) Poverty Scholarships:

(1)—(2) Two scholarships, each of Rs. 56 per annum, are to be awarded to two students who are judged to be deserving in consideration of their pecuniary circumstances, provided their proficiency in studies is satisfactory, as estimated on the basis of the marks obtained in the Intermediate Examination.

(ii) *Catholic Scholarships*: (1) Mgr. Kurialacherry Scholarship, of Rs. 112 per annum, tenable for two years, is to be awarded to a Catholic student of the Third University class, who is judged to be most deserving, in consideration of his proficiency in studies estimated on the basis of the marks obtained, preferably in the first sitting, in the Intermediate Examination and in consideration of his pecuniary circumstances. This scholarship may be equally divided between two deserving candidates.

(2) The Mgr. Kallarakal Scholarship, of Rs. 60 per annum, tenable for 2 years, is to be awarded to the student who passes the Intermediate Examination of the University of Travancore from this College, securing the highest marks among the students of this College in the Intermediate Examination in Religious Instruction, and joins the Junior B. A., or B. Sc., class of this College.

#### Medals.

1. 'Dr. Kurialacherry Gold Medal.' The medal is awarded each year to the student of the second University class of this College who stands highest in the Intermediate Examination of the University.

2. 'The College Gold Medal' is awarded every year to the student of the fourth University class of this College who stands highest in the first or second class in the B. A., or B. Sc. Degree Examination.

3. 'Watts Gold Medal' (The medal was founded in 1926 in honour of M. E. Watts, Esq., 'Bar-at-Law,' the then Dewan of Travancore).



The medal is awarded annually to the student of the fourth University class of this College who stands highest in the first or second class in English in the B. A. or B. Sc. Degree Examination.

7 Fees :—

Intermediate:	Group I	Rs. 94	per annum
	Group II	Rs. 97	"
	Group III	Rs. 85	"
B. Sc.	Mathematics	Rs. 112	"
Do.	Bot. & Zool.	Rs. 130	"
B. A.	Economics	Rs. 112	"
Admission fee		Rs. 2	"
Medical Inspection fee		Re. 1	"

Special fees Rs. 15 for Reading Room, games, magazine, College Union and College Examination.

8. Numerical Strength—(1942—43)

Class I	Group I	117	}	243
	" II	77		
	" III	49		
Class II	Group I	81	}	161
	" II	54		
	" III	26		
Class III	Mathematics	17	}	88
	Botany	10		
	Zoology	20		
	Economics	41		
Class IV	Mathematics	16	}	86
	Botany	14		
	Zoology	20		
	Economics	36		

9. Library. The Library contains about 1,0227 volumes.

10. Physical Education etc. Every student is expected to take part in one or more of the games for which facilities are provided by the College or in regular gymnastics under the supervision of the Physical Instructor.

Provision is made for Foot-ball, Badminton, Volley ball, Hockey, Basket ball, Tennis and Cricket.

The College publishes its own Magazine, 'The Excelsior'.

11. College Staff.

Principal : Rev. Fr. Romeo Thomas, T. O. C. D., M. A., L. T.

Vice-Principal : Rev. Fr. A. C. Eapen, B. A., Ph D.

Bursar : Rev.<sup>fr</sup> Fr. Joseph Kuriathadam, M. A.  
 English : Mr. A. P. O'Brien, M. A., B. L.  
             Rev. Fr. Joseph Kuriathadam, M. A.  
             Mr. C. S. Kurian, B. A. (Hons.)  
             ,, P. T. Chacko, M. A.  
             ,, K. T. Mathai, B. A. (Hons.)  
             ,, M. J. Varghese, M. A.  
             ,, K. V. Thomas, B. A. (Physical Director)

### Languages :

#### (a) Malayalam and Sanskrit.

Mr. P. V. Ulahannan, M. A.  
 ,, Devasia Thakidiel, M. A.  
 ,, P. R. Doraiswami Sarma, (Siromani) B. O. L.

#### (b) Syriac : Rev. Fr. K. C. Mathai, B. A. Rev. Fr. Joseph Kurias.

### Mathematics :

1 Mr. T. A. Satagopan M. A., L. T.,  
 2 ,, M. T. Kurien M. A.  
 3 ,, P. C. Joseph B. A. (Hons.)

### Botany :

1 Mr. M. S. Raghavachari M. A.  
 2 ,, R. Vaidyanathan M. A.  
 3 ,, P. C. Mathew B. Sc. (Hons.)  
 4 ,, O. J. Kuruvilla B. A.

### Zoology :

1 Mr. C. John M. A.  
 2 ,, K. J. Joseph M. A.  
 3 ,, K. T. Kurien B. A.  
 4 ,, V. J. Mathai M. Sc.

### Economics and History :—

1 Rev. Fr. Romeo Thomas, T. O. C. D., M. A., L. T.  
 2 Mr. P. R. Krishna Iyer, B. A. (Hons.)  
 3 ,, L. M. Pylee, M. A., B. L. (On leave)  
 4 ,, O. C. Varghese, M. A., L. T.  
 5 ,, K. J. Cyriac, B. A. (Hons.), B. L.  
 6 ,, Rev. Fr. P. C. Mathew, M. A.

### Physics :

1 Mr. D. Gopalan, B. A. (Hons.)  
 2 ,, T. J. Joseph, B. A.  
 3 ,, S. L. Thomas, B. A.  
 4 ,, S. Harihara Iyer, B. Sc.

**Chemistry :**

	1	Mr. T. T. Chacko, M. A.
	2	Rev. Fr. Francis Kalacherry B. A., L. D.
	3	Mr. K. C. Pappoo, B. Sc.
	4	" K. M. Luke, B. A.
Logic	1	Rev. Fr. A. C. Eapen, B. A., PH. D.
Physical Education	} 1	Mr. K. V. Thomas, B. A., Diploma in Physical Education.
		2 D. Varughese, B. A., Diploma in Physical Education.
Library Warden	} 1	Mr. P. V. Ulahannan, M. A., Diploma in Librarianship.
Librarian		1 Mr. E. M. Joseph, B. A. do.

**IV. The Union Christian College, Alwaye.**

1. *General.* This institution was founded in June 1921 as the result of a desire among some of the Christian churches in Travancore and Cochin for co-operation in educational work.

An old Cutcherry building and 20 acres of land surrounding it were granted to the College by the Government of Travancore in September 1921. About 24 acres have been subsequently added by the purchase of adjacent plots.

The College is almost entirely residential, the great majority of the students and a large number of the members of the staff living in quarters provided for them in the college premises.

2. *Management.* The College is owned and governed by a Council which is an Association registered under the Companies Regulation of Travancore, including among its members representatives of "The Malankara Syrian Church", "The Mar Thoma Syrian Church and "The Church of India, Burma and Ceylon in the Diocese of Travancore and Cochin".

3. *Finance.* The main sources of income have been donations from sympathisers in India and abroad, Government grants and fees collected from students. From the starting of the College and especially since its development as a First Grade College the Church Missionary Society has been taking a keen interest in the institution and helping it by maintaining one of its missionaries to work as a member of the College staff. A provident fund to which the Management contributes one-half has been started for the benefit of the permanent members of the Staff.

4. *Buildings.* The College buildings consist of two two-storeyed structures, one for the accommodation of the Arts Department and the other for the Science Department. There is also a separate building for the use of the teaching staff. Five houses for married members of

the staff were constructed, one in August 1925, another in June 1929, the third in November 1931, the fourth in November 1935, and the 5th in August 1940.

5. *Hostels.* There are five hostels providing accommodation for about 260 students and eight resident wardens. The first hostel was completed in August 1922 and formally opened by Dr. Rabindranath Tagore on 18th November 1922. This hostel is known as "The Tagore Hostel." A second hostel was completed in April 1924. A third was completed in June 1924. It is called "The Holland Hostel" in recognition of the valuable services rendered to the College by the Rev. Canon W. E. S. Holland, late Principal of St. John's College, Agra. A fourth hostel was completed in September 1928. A part of the fifth hostel was completed in September 1936. Each hostel has a common room, a prayer room and a sick room.

Six mess houses were constructed in the course of the first four years, one for the Brahmin Mess, another for the Nair Mess, a third for the Cosmopolitan Vegetarian Mess and the remaining three for the Cosmopolitan Non-Vegetarian Messes. A canteen was opened in a building erected for the purpose in June 1925.

6. *Courses of Studies.* The College offers instruction in the Intermediate, B. Sc. and B. A. Degree Courses. The following courses of studies are provided for :—

Intermediate classes :—

Part I—English

Part II—Malayalam

Part III—Optional Subjects :—

Group i. (a) Mathematics, Physics and Chemistry

„ i. (b) Mathematics, Physics and Logic

„ ii. Biology, Physics and Chemistry

„ iii. Ancient History, Modern History and Logic.

B. Sc. Degree classes :—

Part I—English

Part II—Malayalam

Part III—Group (i-a) Mathematics

„ (ii-a) Physics main and Mathematics subsidiary.

B. A. Degree classes.

Part I—English

Part II—Malayalam

Part III—Optional subjects :—

Group (i-a) Philosophy

„ (i-b) Philosophy and History

„ (ii-a) History and Economics

„ (ii-b) Economics and History.

7. *Library.* The Library consists of about 7,300 volumes. The Library is divided into three sections, the General Library, the Class Libraries and the Consulting Library.

A gift by the Rev. C. F. Andrews helped to form the nucleus of the poetry section of the General Library and it is called the "Tagore Library" after the poet Rabindranath Tagore. A gift made by Sir Alladi Krishnaswami Ayyar helped to form the nucleus of the History section of the Class Library and it is called the "Kellet Library" after the late Professor F. W. Kellet of the Madras Christian College.

Books on subjects other than English, Malayalam and Theology are placed in Class Libraries under the charge of the respective lecturers.

8. (a) *Scholarships.* (i) The Boobili Scholarship. This scholarship was founded by Dewan Bahadur Dr. V. Varghese in the year 1926 in memory of his son Boobili who died in February 1926. It is of the annual value of Rs. 120. It is awarded either to a student of the Junior Intermediate class or to a student of the Junior B. A. or B. Sc. class. In the former case it is tenable for the four years of the Intermediate and Degree courses and in the latter for the two years of the B. A. or B. Sc. course provided the conduct and progress of the scholar are satisfactory. If, for any reason, the scholarship is forfeited by its holder it becomes available for award to another student before the end of four years.

(b) *Class Scholarships.* Intermediate :—(1) One scholarship of the annual value of Rs. 90 and two scholarships of the value of Rs. 60 each tenable for two years are awarded in the Junior Intermediate class on the basis of the marks obtained by the applicants in the E. S. L. C. Examination.

(2) A few exhibitions of the value of Rs. 42 each tenable for two years are awarded in the Junior Intermediate class to poor and deserving students, special consideration being given to students belonging to backward communities and those who live in the college hostels.

(3) H. H. the Maharaja's scholarships awarded on the basis of the marks in the School Final Examination are tenable for two years in the Intermediate classes in the College.

(4) Merit prizes are awarded in the Senior class on the basis of the examinations in the Junior-class.

#### *B. A. and B. Sc. Classes.*

(1) A few scholarships of Rs. 56 each tenable for two years are awarded in the Junior B. A. or B. Sc. Class to those who have secured a First Class in the Intermediate Examination.

(2) A few Exhibitions of Rs. 56 each, tenable for two years are awarded in the Junior B. A. or B. Sc. class to poor and deserving students, special consideration being given to students belonging to backward communities.

(3) Merit prizes are awarded to the Senior class on the basis of the examination in the Junior class.

(4) H. H. the Maharaja's Scholarship, awarded on the basis of the marks in the Intermediate examination, are tenable in the College.

9. *Games.* The College makes provision for Foot-ball, Hockey Tennis, Badminton, Volley-ball and Basket-ball. Prizes are awarded, every year to successful competitors at the annual college sports. There is a Physical Director on the staff.

10. *Societies.* College Societies include the Associated Societies, the Literary and Debating Society, the Malayalam Association, the Philosophical Association, the Historical Association, the Science Association, the Dramatic Society, the Day Scholars' Association the Social Service League and the Student Christian Fellowship.

A co-operative society also has recently been started.

11. *Women Students.* Women were admitted for the first time to all the classes of the College in June 1939. There are now 61 women students on the Rolls. 51 live in a Hostel which has been started for them.

12. *Strength, scales of fees, etc., (strength as at the end of 1942-43).*

Class.	Group.	No. of students.	Rate of fees per year.
First year.	Mathematics, Physics and Chemistry	62	Rs. 84 plus Rs. 10 Laboratory fees.
	Mathematics, Physics and Logic	41	Rs. 84 plus Rs. 4 Laboratory fees.
	Biology; Physics and Chemistry	34	Rs. 84 plus Rs. 13 Laboratory fees.
	Ancient History, Modern History and Logic	24	Rs. 84.
Second year.	Mathematics, Physics and Chemistry	53	Rs. 84 plus Rs. 10 Laboratory fees.
	Mathematics, Physics and Logic	17	Rs. 84 plus Rs. 4 Laboratory fees.
	Biology; Physics and Chemistry	44	Rs. 84 plus Rs. 13 Laboratory fees.
	Ancient History, Modern History and Logic	21	Rs. 84.
Third year.	Mathematics	12	Rs. 112.
	Physics main and Mathematics Subsidiary	24	Rs. 112 plus Rs. 12 Laboratory fees
	Philosophy	6	Rs. 112.
	History and Economics	4	Rs. 112.
	Economics and History	32	Rs. 112.
Fourth year.	Mathematics Physics main	5	Rs. 112 plus Rs. 8 Laboratory fees.
	Mathematics subsidiary	20	
	Philosophy	9	Rs. 112.
	History and Economics	3	Rs. 112.
	Economics and History	28	Rs. 112;

13. *The Staff.*

Principal : Mr. V. M. Ittyerah, M. A., B. Litt.  
 Bursar : „ C. P. Mathew, M. A.

*English Department.*

Mr. A. M. Varki, M. A., B. L. (on leave)

Rev. T. V. John, M. A., L. T.

Mr. A. Aravamudha Aiyangar, M. A.

Rev. Deacon K. C. Joseph, M. A.

Mr. Ninan Abraham, B. A. (Hons.)

„ C. G. Raghava Kurup, B. A., (Hons.)

„ K. S. Abraham, B. A.—Tutor.

Miss. A. Poonen B. A., (Hons.) Tutor

*Malayalam Department.*

Mr. D. P. Unni, M. A.

Mr. P. Krishna Pillai B. O. L., Assistant Lecturer

*Mathematics Department.*

Mr. T. S. Venkataraman M. A.

„ M. G. Koshy B. A. (Hons.)

Miss C. Varkky B. A., (Hons.) Assistant Lecturer.

*Physics Department.*

Mr. T. B. Ninan M. A.

„ T. B. Thomas B. Sc. (Hons.)

„ A. J. John M. Sc.—Demonstrator.

„ C. V. Sethunathan, B. Sc. (Hons.)

*Chemistry Department.*

Mr. T. R. Anantharaman B. A.

Miss Annie John B. A.—Demonstrator.

*Natural Science Department.*

Mr. T. C. Joseph, M. A.

„ C. P. Andrews, B. A.—Demonstrator.

*Philosophy Department.*

Mr. C. P. Mathew, M. A.

„ K. Jacob, M. A.

„ K. C. Chacko, M. A.

*Departments of History and Economics.*

Mr. V. M. Ittyerah, M. A., B. Litt.;

„ T. I. Poonen, M. A.

Rev. B. G. Crowley, M. A.

Mr. T. V. Ramanujam, B. A. (Hons.).

*Physical Director-*

Mr. C. P. Andrews, B. A.



## OTHER INSTITUTIONS AND DEPARTMENTS OF ACTIVITY.

### I. THE INSTITUTE OF TEXTILE TECHNOLOGY.

1. The Institute of Textile Technology was opened on the 22nd August 1938.

2. It provides instruction in the following courses :-

(i) Diploma courses in—

(a) Textile Technology.

(b) Textile Chemistry.

(ii) Certificate Courses in—

(a) Weaving—Hand and Power Looms.

(b) Bleaching, Dyeing, Printing and Finishing.

(c) Embroidery, Needle-work and Knitting (for women only).

The courses are so framed as to ensure a thorough grounding in the various branches of the Textile industry. Special emphasis is laid on practical training and facilities are provided for laboratory and workshop practice.

and (iii) Craftsman's courses.

3. The Diploma Courses consist of theoretical and practical instruction in the following subjects :—

(a) *Textile Technology* :—

1. Mathematics.
2. Mensuration.
3. Chemistry.
4. Physics.
5. Freehand Drawing.
6. Model Drawing.
7. Practical Weaving.
8. Sketching of Textile Machinery.
9. Textile Fibres and Spinning.
10. Weaving Mechanism.
11. Fabric Structure.
12. Weaving and Spinning calculations.
13. Design and Analysis of cloth.
14. Preparation of Yarn.
15. Historic Ornamentation.
16. Spinning.

17. Engineering Drawing.
18. Mechanics Shop Practice.
19. Mechanics.
20. Dyeing, Bleaching, Printing and Finishing.

(b) *Textile Chemistry.*

1. Freehand Drawing.
2. Model Drawing.
3. Mathematics.
4. Chemistry.
5. Physics.
6. Textile Fibre and Spinning.
7. Classification and Testing of Fibres.
8. Workshop Practice (Carpentry and Smithery.)
9. Weaving.
10. Dyeing and Printing.
11. Chemistry of Textile Fibres.
12. Construction of works and Machine Drawing.
13. Costing and Estimating.
14. Technology of Bleaching, Mercerising, Printing and Finishing.

The Diploma courses extend over a period of three years. The minimum qualification for admission to the Diploma courses will be the English School Leaving Eligibility Certificate with 60 per cent. marks in Mathematics and Science and 50 per cent. of the total marks.

4. The Certificate Courses extend over a period of two years. Admission to the courses will be open only to candidates who have at least completed the English School Leaving Certificate course.

5. Six students will be admitted every year to each of the Diploma and Certificate courses.

6. Ordinarily, no student who has not completed 17 years of age will be admitted to either the Diploma courses or the Certificate courses.

7. Students of the Institute will be required to play games or attend Physical Training Classes.

8. Students not residing with their parents or guardians will be required to stay in approved hostels or lodgings.

9. *Rates of fees.*

Diploma course—Rs. 56 per academic year (in 8 equal instalments.)

Certificate course—Rs. 40 per academic year (in 8 equal instalments.)

Laboratory fee of Rs. 5 per year for both the Diploma and Certificate courses.

Athletic fees and Health Service fee of Rs. 4 and 1 respectively per year for the Diploma Courses ; and Athletic fee of Rs. 2 per year for the Certificate courses.

Non-Travancoreans may be admitted to the Institute, if seats are available. They will be required to pay an annual fee of Rs. 120 for the Diploma course and Rs. 80 for the Certificate course.

#### 10. *Government Scholarships.*

Scholarships to the value of Rs. 5 each per mensem are awarded for one year to two students of the second year course in each of the Diploma and Certificate courses in Textile Technology and Textile Chemistry, and Embroidery, Needle-work and Knitting.

Scholarships to the value of Rs. 7-14-0 each per mensem are awarded for one year to two students in each of the third year Diploma Courses of the Textile Technology and Textile Chemistry Sections.

"Kerala Scholarship" of the value of Rs. 12 (twelve) per mensem is awarded to the best student in the second year Diploma Course of the Textile Chemistry Section, for the rest of the Course.

#### 11. The staff :—

Principal { N. K. Padmanabha Pillai Esq., F. R. S. A., Medalist  
City and Guilds, (London).

##### *Textile Technology Section.*

Mr. M. P. G. Nair, T. T. W. F.M. Spin. Tech.

„ G. S. Ramakrishnan B. A., L. T. M.

„ Thomas Varghese, L. T. M.

##### *Textile Chemistry Section.*

„ K. Kylas, L. T. C. (Hons.) (on other duty.)

„ P. N. Nair.

„ T. V. Punnoose B. Sc.

**Chemistry, Physics and Mathematics.**

Dr. K. L. Moudgill, M. A. (Cantab), B. Sc. (Glasgow) F. I. C.  
(London) (Part-time.)

„ P. P. Pillay, D. Sc.	do.
Mr. Ittyerah Joseph, M. A., A. I. I. Sc.	do.
„ E. T. Mathew, M. A.	do.
„ A. Narayanan Potti, M. A.	do.
„ C. Balasubramoniam, B. Sc. (Hons.)	do.
„ C. Joseph, M. A.	do.
„ M. Nathaniel, B. Sc. (Hons.)	do.
„ P. C. Eappen B. Sc. (Eng.)	do.
„ T. C. George B. A., B. (Eng.)	do.

*Workshop, Carpentry, Smithery and Rattan Section.*

Mr. S. Joseph.

*Drawing Section.*

R. Govindan Asari.

*Embroidery and Hosiery Section.*

Mr. P. Bhakthavatsalam.

Mrs. A. T. Hall.

Miss Rajamma Thomas.

Mrs. Dery David.

*Carpet and Coir Manufacture Section*

Mr. G. S. Ramakrishnan, B. A., L. T. M

„ Gaffar Sahib.

„ T. R. Krishnan.

(For fuller information regarding the Institute of Textile Technology, see separate prospectus.)

## II. THE TRIVANDRUM PUBLIC LIBRARY.

### History.

The Trivandrum Public Library is an important and useful institution in Travancore. It came into existence during the early part of the last century through the efforts of certain high officials of the Travancore Government and the Residency. During the year 1847 the Public Library Society with a limited membership was organised and this formed the nucleus of the Trivandrum Public Library.

From the very first, the Library received liberal assistance from the Travancore Durbar. The records of the Library show that His Highness Sri Visakham Tirunal was greatly interested in the institution and was often present at the meeting of the Library Committee.

In 1894 the Public Library Society was registered as a Joint Stock Company and became the Public Library Association, membership being thrown open to all persons residing in Trivandrum and conforming to the Rules of the Association. His Highness the Maharaja became the Patron of the Library, and Mr. Grigg, the Resident, became the President of the Committee. In 1897 the Association under agreement handed over its entire property to Government on condition that Government erected a suitable building and established a free Library for the use of the public in commemoration of the 60th year of H. M. Queen Victoria's reign. Since 1898 the Government of Travancore have been managing the Public Library.

The Library is housed in a beautiful building at Trivandrum with fairly extensive grounds all round. The Library contains over 35000 volumes and the number is being added to, year after year. There is a good collection of rare, very old and costly books and manuscripts which are available for free consultation by any one. The Library subscribes for 87 periodicals of which 11 are Travancorean, 49 Indian and the rest British and American.

With a view to make its resources available for the University, Government have ordered the transfer of the institution to the administrative control of the University.

The terms of membership and subscribership are as follows :—

No.	Class.	Subscription.	Deposit.	Privileges.
1	Members "A" Class	Rs. 2 per month or Rs. 10-8 0 for 6 months in advance or Rs. 20 for 12 months in advance	Rs. 10	(a) The loan of 8 books when in Trivandrum. (b) The loan of 12 books when on circuit. (c) The use of the Members' Room. (d) The Member can nominate one <i>bona fide</i> member of his family residing with and wholly dependent on him to use the Members' Room without his having to pay any subscription.
2	Members "B" Class	Rs. 1 per month or Rs. 5-8-0 for 6 months in advance or Rs. 10 for 12 months in advance	10	(a) The loan of 4 books. (b) The use of the Members' Room.
3	Eight anna Subscribers	8 As. per month	3	The loan of 2 books at a time.
4	Four anna Subscribers	4 As. per month	2	The loan of 1 book at a time.

### Affiliated Libraries.

With a view to extend the usefulness of the institution to the people of Travancore outside the Capital, there is provision for affiliation of Mofussil Libraries to the Public Library under the following conditions :—

The fees payable by a Library is Bh. Rs. 9 per year or Bh. Rs. 5 for 6 months if paid in advance or Bh. Re. 1 per month. Each Library is entitled to the loan once a month, of a variable number of books whose total weight does not exceed 600 tolas. But Libraries receiving books through the State Transport Service are entitled to the loan of 20 volumes every month. The transmission charges, to and fro of the parcels are borne by Government.

The Libraries at present availing themselves of the advantages of affiliation are :—

- (1) The Dixon Library, Chengannoor,
- (2) The Municipal Library, Quilon
- (3) The Mar Thoma School Teachers' Association and Library, Thiruvella.
- (4) The Sri Chitra Memorial Club and Library, North Parur.
- (5) The Ananda Dayini Library, Manganam, Kottayam,
- (6) The P. John Memorial English School Old Boys' Association and Library, Aymanam, Kottayam.
- (7) Sri Avittam Thirunal Reading Room & Vani Vilasom Library, Kottayam.
- (8) Leo XIII Reading Room and Library, Champakkulam.
- (9) The Sri Mulam Silver Jubilee Reading Room and Library, Thodupuzha,
- (10) The Ollannur Rural Reconstruction Institute, Pandalam,
- (11) Sri Moolam Club & Library, Devicolum.
- (12) Sri Moolam Reading Club, Shencottah.

### Readers.

Anyone coming to the Library is freely permitted to make use of the books and periodicals of the Institution. The Research student is given all convenience for the silent study in the Reference Room. The Members of the Library Staff render all help to those who wish to read in the Library.

The Reading Rooms are open from 7-30 A. M., to 8-30 P. M. on all days except a very few holidays. The book rooms are open from 8-30 A. M., to 11-30 A. M. and from 3 P. M. to 6 P. M.

The general reading room has become very popular, the average number of readers per month being nearly 8871.

The Library is administered by a Committee of nine members consisting of (1) the Pro-Vice Chancellor of the University, President (Ex-Officio), (2) the Librarian of the University,—the Honorary Secretary (Ex-Officio) (3) three representatives of the University, nominated by the Vice-Chancellor and (4) four other members nominated by the Government from among the 'A' Class Members of the Library. The personnel of the present Committee is as follows :—

- (1) M. R. Ry. C. V. Chandraskharan Avl. (President).
- (2) „ T. Damodaran Nambisan Avl.
- (3) „ Vaidyasastranipuna, L. A. Ravi Varma Avl.
- (4) Dr. K. L. Moudgill.
- (5) M. R. Ry. Rajyasevapravina G. Parameswaran Pillai Avl.
- (6) „ P. Sivasankara Pillai Avl.
- (7) „ K. George Esq.
- (8) „ N. Krishnamurti, Avl.
- (9) Dr. A. Sivaramasubramonia Iyer  
(Honorary Secretary)

### III. THE TRIVANDRUM OBSERVATORY.

The Trivandrum Observatory was founded in 1836 A. D. during the reign of His Highness Sri Swathi Thirunal Maharaja. By his valuable efforts Mr. John Allan Brown, F. R. S., Director of the Observatory from 1852-65 showed the scientific world the importance of carrying on Astronomical, Magnetic and Meteorological observations at Trivandrum.

In 1927 the institution was divided into two separate sections, Astronomical and Meteorological.

The Astronomical Branch publishes in advance an Annual Astronomical Ephemeris for Trivandrum, forming part of the Travancore Directory. Local time is determined by both Transit observations and receiving of Wireless Time Signals. Photographs of the Sun and the Moon are taken whenever special phenomena have to be recorded. Observations of the solar prominences by the direct vision Spectroscope are made when there are maximum spots on the solar disc. The 5' Equatorial is used in familiarising the students with the surface markings

and other details of the Sun, Moon, Planets and Nebula. Double and variable stars are also studied by this instrument.

Students who desire to acquire practical training in astronomical work will be afforded facilities for the same in case they apply to the University and pay a fee of Rs. 15 for such training. They should also deposit a sum of Br. Rs. 50 as caution money, which will be returned after the period of training, provided there are no liabilities against them.

The amalgamation of the two sections of the Observatory, vesting the administrative charge of both sections in the Senior of the two officers, with the designation "Superintendent" of the Observatory was given effect to from the 1st Chingom 1116.

The Observatory is recognised as a first class Meteorological Observatory by the Meteorological Department of the Government of India. Eye observations of meteorological elements are taken and telegraphed to Poona for purposes of weather forecasting. The observatory is equipped with self-recording instruments for continuous registration of pressure, temperature, humidity, wind velocity, wind direction and rainfall. The results of the daily observations are published in the Indian Daily Weather Report and also incorporated in the Monthly and Annual Weather Reviews published by the India Meteorological Department. A daily Weather Report is also issued from the Observatory and a summary of the principal Meteorological results and general weather is published weekly in the Government Gazette.

A pilot balloon station was opened as an annexe to the Meteorological Branch in December 1928, under the technical supervision of the upper Air Section of the India Meteorological Department at Agra. All results relating to upper winds are published in detail in the Daily Weather Report and the Monthly Upper Air Reviews published by the India Meteorological Department and relevant data are supplied to pilots who land at the Trivandrum Aerodrome.

The Department supplies standardised rain gauges and accessories to the 76 gauging stations maintained by the Government and also supervises the work done at these stations, besides giving technical advice to 25 non-departmental stations.

A weather station for eye observations of pressure, temperature, humidity and wind has been recently started at the Alleppey Port under the technical supervision of the Government Meteorologist. This station guides the Port Officer in the issue of caution signals.

#### IV. THE SCHOOL OF ARTS.

The School of Arts is an institution under the Department of Fine Arts in the University. The School was started in 1889. Students



are given instruction in drawing and other allied subjects as well as in some of the handicrafts such as carving in wood, cocoanut shell or ivory, smithery including silversmith's work and kuttigari work, pottery and modelling and lacquerwork. Stipends are offered once in two years for 15 students in the drawing and other handicraft sections and 7 students in the lacquer work section.

The manufacturing section of the school supplies various articles to Government Departments and private agencies.

## V. DEPARTMENT OF PUBLICATIONS.

With the object of enriching Malayalam and Tamil literatures by the production of up-to-date books on various subjects, a Department of Publications has been instituted.

The preparation of glossaries in Malayalam of scientific and technical terms has been taken in hand. Three glossaries have been published.

Monographs in Malayalam on Electricity and Sociology and the Malayalam translation of a classical work from the original Greek have already been published. Arrangements for the publication of similar monographs and books have also been made.

## VI. THE TRAVANCORE CENTRAL RESEARCH INSTITUTE.

To provide increased facilities for research in Applied Science, a scheme for the organisation, under the auspices of the University, of a Central Research Institute, where the various research units attached to the scientific and technical departments of Government could be brought together, was prepared and submitted to Government. Government sanctioned the scheme and transferred (in August 1939) to the control of the University the Public Health Laboratory of the Department of Public Health, the Water-Analysis Section of the Water Works Department and the Research Sections of the Department of Agriculture and Fisheries and the Department of Industries. The Fisheries Section of the Department of Agriculture and Fisheries was transferred to the University in August 1940 and was placed under the Professor of Marine Biology and Fisheries in the Department of Research. The Travancore Central Research Institute has at present the following sections :—

- (i) Applied Chemistry, including Organic, Inorganic and Physical Chemistry.

- (ii) Applied Physics and Mathematics including 'Astronomy Meteorology and Statistics.
- (iii) Applied Biology including Plant-breeding, Mycology and Entomology.
- (iv) Public Health
- (v) Bio-Chemistry including Industrial and Agricultural Bio-Chemistry and Nutrition Research.
- (vi) Marine Biology and Fisheries.

Various problems which have a direct bearing on the economic life of the country are being investigated.

Whenever an item of work reaches a stage at which it can be taken up on a commercial basis, the Institute starts a commercial undertaking or encourages private agencies to do so in collaboration with the University. The following activities are being conducted on a commercial basis.

- (1) Distillation of crude oil and garage waste oil for the recovery of high speed Diesel oil.
- (2) Production of Shark Liver oil under the trade name "Sharliverol."
- (3) Cold-storage and transport of frozen fish to inland area.

In addition to these activities, the Institute has arranged with the Travancore Sugars and Chemicals Ltd., to place on the market a coagulant for Rubber latex under the trade name "Sulpholex."

The University has instituted eight Research Scholarships each of the value of Rs. 30 per mensem and four Research Fellowships each of the value of Rs. 50 per mensem.

#### **Rules of the Council of Research.**

1. The general administration of the Central Research Institute shall vest in the University in consultation with a Council of Research. The Council shall consist of :—

- 1. The Vice-Chancellor ;
- 2. The Pro-Vice-Chancellor ;
- 3. The Dean of the Faculty of Science ;
- 4. The Chief Engineer ;
- 5. The Electrical Engineer ;
- 6. The Director of Agriculture ;
- 7. The Director of Public Health ;
- 8. The Director of Industries ;

9. The Surgeon-General ;
10. The Conservator of Forests ;
11. The Principal, College of Engineering ;
12. The Principal, H. H. The Maharaja's University College ;
13. The Professor of Mathematics. do.
14. The Professor of Physics do.
15. The Professor of Chemistry do.
16. The Professor of Botany do.
17. The Professor of Zoology do.
18. The Professor of Civil Engineering, College of Engineering ;
19. The Professor of Mechanical Engineering, College of Engineering ;
20. The Principal, Institute of Textile Technology ;
21. The Secretary, Stores Purchase Committee ;
22. The Heads of various sections of the Institute ;
23. Members nominated by Government, not exceeding five; and
24. Members nominated by the Syndicate not exceeding five of whom two shall be from the staff of private Colleges.

2. The nominated Members of the Council shall hold office for a period of three years from the date of their nomination. They may be re-nominated. A nominated member shall be treated as having vacated his place, if he becomes an ex-officio member of the Council.

3. The duties of the Council will be :—

- (a) to initiate or examine schemes of research to be undertaken or assisted by the Institute of Research and to Report to the university on their feasibility, importance and urgency ;
- (b) to review the progress of investigations undertaken or assisted by the Institute and to report on the necessity or desirability of continuing, suspending or modifying the schemes ;
- (c) to consider and report on the institution of Fellowships, Studentships and Grants-in-aid of Research ;
- (d) to offer advice on such matters as the Government or University may place before the Council.

4. The Vice-Chancellor of the University shall be the Ex-officio Chairman of the Council ; but he may delegate all or any of his functions to the Pro-Vice-Chancellor or any other member of the Council,

5. There shall be a Vice-Chairman appointed by the Government from among the members of the Council on the recommendation of the Syndicate. He shall be the principal executive officer of the Institute.

6. The Vice-Chairman shall be a person with Scientific training and experience in research.

7. The council shall ordinarily meet once in three months and at such other times as the Chairman may direct.

8. The Chairman shall preside at all meetings of the Council for which he is present. In his absence the Vice-Chairman shall preside; and when both the Chairman and the Vice-Chairman are absent the Council may elect a Chairman from among the members present for that meeting. The Vice-Chairman shall make a progress report at each meeting of the Council regarding the Institute.

9. The Council may appoint Sub-committees for the conduct of its business and for any specific scheme or programme of work.

10. The Council may, with the approval of the Vice-Chancellor, co-opt members for any specific purpose and such members may be appointed to serve on the sub-committees of the Council. Persons other than members may be invited by the Chairman to be present at any meeting and to tender advice.

11. The work of the Institute shall be sectionalized according to subjects. In the first instance, the following sections shall be formed:—

- (i) Applied Chemistry including Organic, Inorganic and Physical Chemistry.
- (ii) Applied Physics and Mathematics including Astronomy, Meteorology and Statistics.
- (iii) Applied Biology including Plant-breeding, Plant Pathology, Mycology and Entomology.
- (iv) Public Health.
- (v) Bio-chemistry including Industrial and Agricultural Bio-chemistry and Nutrition Research.
- (vi) Marine Biology and Fisheries.

The administration of the sections will be entrusted to responsible Heads working under the Vice-Chairman. The powers of the Heads of Sections will be defined from time to time by the Syndicate.

12. The following general services shall be under the direct control of the Vice-Chairman :—

- (i) Library.
- (ii) Gas, water and Electric supply.
- (iii) Small workshop for maintenance and repair purposes.
- (iv) Indenting and Stores.

13. The Vice-Chairman shall be assisted in the administration of the Institute by a Standing Committee consisting of the Heads of various sections in the Institute.

#### VII. The Oriental Manuscripts Library.

The Oriental Manuscripts Library was started in September 1938 with 1300 codices collected by Pandit R. A. Sastri. Since then a large number of manuscripts has been acquired by purchase, gift or on loan. Government sanctioned the amalgamation of the Department for the Publication of Oriental Manuscripts with the Library from 12.1-1940. The Library possesses at present over 16900 manuscripts, 1372 transcripts and 2312 printed books. The scripts represented include Vattezhuttu, Malayalam, Tamil, Sanskrit, Grantha, Nandi-nagari, Devanagari, Telugu, Bengali and Oriya. Besides, the Library has now collected a number of manuscripts in Kanarese script also.

The Library contains two sections, namely the Publication Section and Library Section. Old and rare works are being published under the auspices of the University and there are two series :  
(1) Sanskrit series and (2) Malayalam series.

The manuscripts in the Library are being properly catalogued by a temporary staff appointed for the purpose.

#### VIII. The Travancore University Labour Corps.

The Travancore University Labour Corps, started in September 1939 was reorganised in August 1941. It is divided into three Companies of three Platoons each. The total strength is about 250.

##### *Commandant.*

Captain T. H. Matthewman.

##### *Adjutant.*

Lt. D. L. Deshpande.

##### *Quarter Master.*

Lt. P. I. Alexander.

2nd in Command and Coy. Commander B. Coy.

Lt. K. P. Padmanabha Pillai

Lt. A. Narayanan Tampi (On other duty.)

##### *Company Commanders.*

Lt. T. K. Koshy.

„ K. Narayanan.

*Platoon Commanders*

Lt. V. Narayana Pillai

,, U. Sivaraman Nair

,, S. Sitarama Iyer

,, K. Kylas

(On other duty.)

2nd Lt. K. C. Chacko!

,, A. S. Narayana Pillai

,, V. Sivasankaran Nair

,, C. Balasubramoniam

,, M. Martin Nathaniel.

## HOSTELS MAINTAINED BY THE UNIVERSITY.

**H. H. The Maharaja's Collegiate Hostel, Trivandrum.**

This institution which was opened in 1083 M. E. as a Caste Hindu Hostel gradually developed and became a cosmopolitan Hostel in 1102 M. E. when the present building was finished. At present it is open to all the men-students studying in the various Colleges maintained by the University.

The Hostel building is an H shaped two-storeyed structure with spacious single seated well furnished rooms and an Assembly Hall. There are twenty-four bath-rooms with shower-baths and four flush-latrines in the building itself. The Hostel maintains a good garden and play grounds (including a Tennis Court) within the premises.

The administration of the Hostel is carried on by the Warden with the help of two Resident Tutors. There is a Medical Officer who visits the Hostel as and when required and attends to cases of illness.

There is provision in the Hostel for one hundred and seven students. There are several sectional messes which are managed by the students under the strict supervision of the authorities.

**2. The College Hostel for Women.**

The College Hostel for women has been housed since 1939 in a spacious, airy building on the premises of the Women's College. There are five large rooms and a Study Hall. The Hostel accommodates thirty students. Facilities have been provided for both indoor and outdoor games and the playgrounds of the Women's College are thrown open to the students in residence in the Hostel.

The management of the Hostel is vested in the Warden,, who is assisted by a Resident Tutor and a Matron. There is a part-time Medical Officer who visits the Hostel once a week and attends to cases of illness.

The Hostel Union is an organisation carrying on varied activities under the management of the students.

### 3. The University Students' Hall.

The University Students' Hall, run by the Board of Physical Education, is housed in the Barracks building opposite the University Play Grounds. It seeks to provide board and lodging for students who cannot afford costly styles of living.

A vegetarian mess has been arranged for and the boarding charges are fixed at Rs. 7 a month per head excluding Re. 1 for electricity and water charges.

The Hall is run on the dormitory plan with common rooms for sleeping, dining, reading and study. Facilities are also provided for playing a few indoor games. All the activities of the Hall are under the control and supervision of a Resident Proctor.

## APPENDIX I.

## Endowment and Donations.

## (1) THE MAHARAJA MARTANDA VARMA ENDOWMENT.

His Highness Sri Padmanabha Dasa Vanchi Pala Sir Bala Rama Varma Kulasekhara Kiritapati Manney Sulthan Maharaja Raja Ramaraja Bahadur Shamsher Jang. Knight Grand Commander of the Most Eminent Order of the Indian Empire, D. Litt., Maharaja of Travancore and Chancellor of the University, made an endowment of British Rupees (25,000) twenty-five thousand, at the time of the formation of the University of Travancore with a view to foster the production of literary and historical works by Travancoreans, in the name of Maharaja Martanda Varma, the founder of modern Travancore. The interest on the endowment is intended to be used in any or all of the following ways :—

- (a) Grants-in-aid.
- (b) Award of Prizes and Medals.
- (c) Award of Scholarships and Fellowships.

At present, provision is made for a Prize and two Scholarships to be awarded under the following rules and the rules of award laid down for each separately.

1. The Syndicate may not make any or all of the awards if there are no suitable candidates.
2. The savings from the annual income shall be added to the corpus of the endowment.
3. The Syndicate shall administer the endowment and may amend or add to the rules of award provided that the funds are not diverted from the object of the endowment.

## Rules of Award.

## (a) THE MAHARAJA MARTANDA VARMA PRIZE.

1. The prize shall be called "The Maharaja Marthanda Varma Prize".
2. It shall be awarded in the form of cash amounting to British Rupees (300) three hundred once in two years, to a Travancorean, by rotation for the best literary or historical work produced since the date of the previous award. The first award shall be made in 1940 for literary work.
3. The award for any year shall be made in the month of November in the succeeding year.
4. Intending candidates shall submit to the Registrar ten printed copies of the work before the end of January in the year of award.
5. The Syndicate may include, for consideration, the work of an author who has not applied for the Prize.
6. The Syndicate shall arrange in consultation with the Dean of the Faculty concerned, for the adjudication of the works.
7. The Prize may not be awarded a second time to the same author. An author may not submit, for consideration a work in respect of which he has already received some other prize or distinction.

1940—Varanattu Mr. K. P. Sastri.

## (b) MAHARAJA MARTANDA VARMA SCHOLARSHIPS.

1. The Scholarships shall be called "The Maharaja Martanda Varma Scholarships".
2. The monthly value of the stipend accompanying each Scholarship shall be Rupees (25) twenty-five only.
3. The Scholarships shall be awarded by the Syndicate to qualified Travancoreans engaged in research work. One of the Scholarships shall be for work in



Kerala Art and Literature and the other for Kerala History. Each shall be tenable for one year in the first instance and may be renewed for one year. No person shall hold a Scholarship for more than two years.

## 2. HER HIGHNESS THE MAHARANI SETU PARVATI BAYI ENDOWMENT.

Her Highness Maharani Setu Parvati Bayi of Travancore, D. Litt., Pro-Chancellor, made an endowment of British Rupees (25,000) twenty-five thousand, at the time of the formation of the University of Travancore with a view to foster scientific research among Travancoreans, with special reference to the industries or agriculture of Travancore. The interest on the endowment is intended to be used in any or all of the following ways :—

- (a) Grant-in-aid.
- (b) Award of Prizes and Medals.
- (c) Award of Scholarships and Fellowships.

At present, provision is made for a Prize and a Fellowship to be awarded under the following rules and the rules of award laid down for each separately :

1. The Syndicate may not make either or both the awards if there are no suitable candidates.
2. The savings from the annual income shall be added to the corpus of the endowment.
3. The Syndicate shall administer the endowment and may amend or add to the rules of award, provided that the funds are not diverted from the object of the endowment.

### Rules of Award.

#### (a) HER HIGHNESS THE MAHARANI SETU PARVATI BAYI PRIZE.

1. The Prize shall be called "Her Highness the Maharani Setu Parvati Bayi Prize."
2. It shall be awarded in the form of cash amounting to British Rupees (300) three hundred, once in two years, to a Travancorean, for the best scientific monograph dealing with the practical applications of scientific research either to industry or agriculture in the State. The Prize shall be awarded in rotation to industry and agriculture, and the first award shall be made in 1940 for a monograph relating to industry.
3. The award, for any year, shall be made in the month of November in the succeeding year.
4. Intending candidates shall submit to the Registrar ten printed copies of the work before the end of January in the year of award.
5. The Syndicate may include, for consideration, a paper or a monograph of an author who has not applied for the Prize.
6. The Syndicate shall arrange, in consultation with the Dean of the Faculty of Science, for the adjudication of the monographs.
7. The Prize may not be awarded a second time to the same author. An author may not submit for consideration, a work in respect of which he has already received some other prize or distinction.

1940. Dr. P. P. Pillay.

#### (b) HER HIGHNESS THE MAHARANI SETU PARVATI BAYI FELLOWSHIP.

1. The Fellowship shall be called "Her Highness the Maharani Setu Parvati Bayi Fellowship."
2. The monthly value of the stipend accompanying the Fellowship shall be Rupees (50) fifty only.
3. The Fellowship shall be awarded by the Syndicate to a qualified Travancorean engaged in scientific research with special reference to its application to

(a) the industries or (b) the agriculture of the State, by rotation, and shall be tenable for one year in the first instance. It may be renewed for one year. No person shall hold the Fellowship for more than two years.

4. The first award shall be made for scientific research as applied to agriculture in the year 1939-40.

### 3. (a) The Sri Chitra Research Scholarship.

Founder :—Sachivottama Sir C. P. Ramaswami Aiyar, K. C. I. E., K. C. S. I., LL. D., Dewan of Travancore and Vice-Chancellor of the University.

Object :—To encourage studies in Kerala History or Archæology, and in the name of His Highness the Maharaja.

Date :—November 1937.

Amount :—British Rupees (12,500) twelve thousand and five hundred.

#### RULES OF AWARD.

1. The Scholarship shall be called "The Sri Chitra Research Scholarship."
2. The monthly value of this Scholarship shall be Rupees (30) thirty only.
3. It shall be awarded by the Syndicate to a student taking up research work in Kerala History or Archæology, and shall be tenable for two years in the first instance. It may be renewed for one further year. No person shall hold the Scholarship for more than three years.
4. The award may not be made, if in the opinion of the Syndicate, there is no suitable candidate.
5. Savings from the annual income shall be added to the corpus of the fund.
6. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the use of the fund is not diverted from the object of the endowment.

1940-41. Mr. N. Krishna Pillay B. A. (Hons.)

### 3. (b) Her Highness the Maharani Setu Parvati Bayi Lecturership in Forest Research.

Founder :—Sachivottama Sir C. P. Ramaswami Aiyar, K. C. I. E., K. C. S. I., LL. D., Dewan of Travancore and Vice-Chancellor of the University.

Object :—To encourage study of and research in Forest problems, and in the name of Her Highness Maharani Setu Parvathi Bayi, D. Litt.

Date :—November 1937.

Amount :—British Rupees (12,500) twelve thousand and five hundred.

#### RULES OF AWARD.

1. The Lecturership shall be called Her Highness the Maharani Setu Parvati Bayi Lecturership in Forest Research."
2. The Syndicate shall appoint a Lecturer every alternate year to deliver a course of not less than five lectures.
3. The Lecturer may be selected either from among the applicants for the Lecturership or the Syndicate may invite a person of outstanding merit to deliver the course of lectures.
4. The subject of the lecture shall relate to Research in Forest Problems.
5. The Lecturer shall be paid an honorarium of British Rupees (500) five hundred only.
6. The Syndicate may publish the text of the lectures in a suitable form or, if it does not decide to do so, may permit the Lecturer to publish the lectures. A grant, not exceeding Rupees (250) two hundred and fifty may be made towards incidental expenses in connection with the lectures, if and when necessary.

7. The Syndicate may not appoint a Lecturer in any year, if a suitable person is not available.

8. Savings from the annual income shall be added to the corpus of the fund.

9. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the fund is not diverted from the object of the endowment.

1941—Rao Bahadur M. Sreenivasaraghavacharya.

#### 4. The F. X. Pereira Memorial Research Scholarship.

Founder :—Mr. J. E. A. Pereira, Member, Sri Mulam Assembly, "Gitanjali", Quilon.

Object :—To encourage investigations on the minerals of Travancore.

Date :—November 1937.

Amount :—British Rupees (10,000) ten thousand.

##### RULES OF AWARD.

1. The Scholarship shall be called "The F. X. Pereira Memorial Research Scholarship".

2. The monthly value of the Scholarship shall be Rupees (25) twenty-five only.

3. It shall be awarded by the Syndicate to a qualified person for research work on the Chemistry or the Geology of the commercial minerals found in Travancore.

4. The Scholarship shall be tenable for two years in the first instance. It may be renewed for only one year more. No person shall hold the Scholarship for more than three years.

5. The award may not be made, if in the opinion of the Syndicate there is no suitable candidate.

6. Savings from the annual income shall be added to the corpus of the fund.

7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment except with the consent of the Founder, if living.

1940 K. R. Gangadharan Nair B. Sc.

#### 5. The Vanjipuzha Chief's Sri Chitra Scholarship.

Founder :—The Vanjipuzha Chief, Chengannur.

Object :—For the encouragement of the study of Sanskrit Literature in Travancore.

Date :—November 1937.

Amount :—British Rupees (10,000) ten thousand.

##### RULES OF AWARD.

1. The Scholarship shall be called "The Vanjipuzha Chief's Sri Chitra Scholarship."

2. It shall be tenable for one year. The monthly value shall be Rupees (25) twenty-five.

3. It shall be awarded to a Travancorean who qualifies for the B. A. (Hons.) Degree or M. A. Degree of the University in Sanskrit and secures the highest marks in the University Examination.

4. If there is no suitable candidate from amongst those who qualify for the M. A. Degree, the Scholarship may be awarded to the student who qualifies for the B. A. Pass Degree and secures the highest marks in Sanskrit for Part III of the Examination, or passes Mahopadhyaya Examination of the University.

5. Till such time as candidates satisfying the qualifications in rules 3 and 4 above are forthcoming, the Syndicate may award the Scholarship to Travancoreans who have passed the corresponding examinations of other Universities.

6. The award may not be made, if, in the opinion of the Syndicate there is no suitable candidate.

7. Savings from the annual income shall be added to the corpus of the fund

8. The Syndicate shall administer the endowment and may amend or add to the rules provided, however, that the use of the funds is not diverted from the object of the endowment.

#### **6. The Rao Sahib Udarasiromani T. Padmanabha Rao Endowment.**

Rao Sahib Udarasiromani Mr. T. Padmanabha Rao made an endowment of British Rupees (5,000) five thousand at the time of the formation of the University of Travancore, with a view to encourage study in His Highness the Maharaja's College of Arts or Science. The interest on the endowment is intended to provide funds for a scholarship and a medal to be awarded under the following rules and the rules of award laid down for each separately.

1. For the scholarship other things being equal, preference has to be given to Brahmin students of either sex and among Brahmins, to Mahratta Brahmins.

2. The Syndicate may not make either or both the awards if there are no suitable candidates.

3. Savings from the annual income shall be added to the corpus of the endowment.

4. The administration of the fund is in the hands of the Syndicate who may invest the fund in suitable securities, and may amend or add to the rules of award, provided, however, that the use of the funds is not diverted for any purpose other than those stated above.

#### **The Rao Sahib Udarasiromani T. Padmanabha Rao Scholarship.**

1. The Scholarship shall be called "The Rao Sahib Udarasiromani T. Padmanabha Rao Scholarship".

2. It shall be awarded to a poor student of the Junior Intermediate Class of His Highness the Maharaja's College of Arts or Science, Trivandrum.

3. Only those who passed the English School Leaving Certificate Examination in their first attempt shall be considered and the award made on the basis of the total number of marks in the examination.

4. The Scholarship shall be awarded for a period of two years, in the first instance, and may be renewed to the holder for a further period of two or three years according as he joins the B. A. Pass or the Honours Course after passing the Intermediate Examination in the minimum period.

5. The award shall be made by the Syndicate, in consultation with the College Council of His Highness the Maharaja's College of Arts or Science.

6. The Scholarship shall not be held jointly with any other scholarship.

7. The Scholarship may be stopped at any time for unsatisfactory progress or misconduct or for failure in any University Examination.

8. The Scholarship shall ordinarily be awarded at the beginning of an academic year. Whenever it falls vacant, it shall be awarded at the commencement of the next academic year to a student of the Junior Intermediate Class.

9. The monthly value of this Scholarship shall be rupees (10) ten in the Intermediate Classes and in the B. A. Pass or Honours Classes.

## **(ii) The Rao Sahib Udarasiromani T. Padmanabha Rao Medal.**

1. The Medal shall be called "The Rao Sahib Udarasiromani T. Padmanabha Rao Medal" and shall be made of 22 carat gold.

2. The Syndicate may decide, from time to time, the cost of the Medal, but it shall not exceed the annual interest on British Rupees (1,000) one thousand out of endowment.

3. The Medal shall have, on its obverse, the University Coat-of-Arms and, on the reverse, around the circumference, the words, "The Rao Sahib Udarasiromani T. Padmanabha Rao Medal" and the year of the award.

4. It shall be awarded annually, by the Syndicate, in consultation with the College Council of His Highness the Maharaja's College of Arts or Science to the best among the students who qualify for a Degree of the University from the College.

5. The award shall be made without any consideration of sex, caste, creed or community.

1941. S. Parameswara Iyer, B. Sc. (Hons.)

## **7. The Ananthasiva Iyer Gold Medals.**

Founder. Mr. M. K. Ananthasiva Iyer, Member, Sri Chitra State Council,  
Kottarathu Matom, Monkompur.

Object. To encourage Engineering studies in the University.

Date. November 1937.

Amount. British Rupees (2,500) two thousand and five hundred.

### **RULES AND AWARD.**

1. The Medals shall be called "The Ananthasiva Iyer Gold Medals."

2. Each Medal shall have, engraved on its obverse, the University Coat-of-Arms and, on reverse, around the circumference, "The Ananthasiva Iyer Gold Medal" and the year of award.

3. The cost of the Medals shall be determined, from time to time, by the Syndicate and shall not exceed the amount of annual interest on the endowment.

4. They shall be awarded annually, by the Syndicate, to the two students who stand first in the final University Examinations in Civil Engineering and Mechanical Engineering.

5. Any or both of the awards may not be made in any year, if, in the opinion of the Syndicate, there are no suitable candidates.

6. Savings from the annual income shall be added to the corpus of the fund.

7. The Syndicate shall administer the endowment and may amend or add to the rules provided, however, that the funds are not diverted from the object of the endowment.

## **8. Her Highness the Maharani Setu Parvati Bayi Gold Medal.**

Founder. Rao Bahadur Rajanithinipuna Mr. Abraham Varghese, Chief Justice,  
High Court, Trivandrum.

Object. To encourage the study of Engineering in the University, and in the name of Her Highness the Maharani Setu Parvathi Bayi, D. Litt.

Date. November 1937.

Amount. British Rupees (1,500) one thousand five hundred.

### **RULES OF AWARD.**

1. The Medal shall be called "Her Highness the Maharani Setu Parvati Bayi Gold Medal" and shall be made of 22 carat gold.

2. The cost of the Medal shall be determined, from time to time by the Syndicate and shall not exceed the amount of annual interest on the endowment.

3. It shall have, engraved on its obverse the University Coat-of-Arms and, on the reverse, around the circumference, "Her Highness the Maharani Setu Parvati Bayi Gold Medal" and the year of award.

4. It shall be awarded annually by the Syndicate to the student who stands first in the Final Examination in Electrical Engineering.

5. An award may not be made, if in the opinion of the Syndicate, there is no suitable candidate.

6. Savings from the annual income shall be added to the corpus of the fund.

7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

### **9. Kerala Varma Valia Koil Tampuran Gold Medal.**

Founder: Mr. S. Viraraghavacharyar, B. A., M. L., Retired High Court Judge, Taikad, Trivandrum.

Object: To encourage Research in Ancient Vedic Literature, Language and Culture, and in commemoration of the name of the Kerala Varma Valia Koil Tampuran (commonly known as Kerala Kalidasa).

Date: November, 1937.

Amount: British Rupees (1,000) one thousand.

#### **RULES OF AWARD.**

1. The medal shall be called "The Kerala Varma Valia Koil Tampuran Gold Medal" and shall be made of 22 carat gold.

2. The Syndicate may decide, from time to time, the cost of the medal, provided that it does not exceed the annual interest on the endowment.

3. The medal shall have, on its obverse, the University Coat-of-Arms and, on the reverse, around the circumference, the words "The Kerala Varma Valia Koil Tampuran Gold Medal" and the year of the award.

4. It shall be awarded by the Syndicate every year to the author of the best essay or thesis embodying the results of research work on Ancient Vedic Literature, Language or Culture.

5. The Medal shall not be awarded a second time to the same person.

6. An award may not be made if in the opinion of the Syndicate, there is no suitable candidate.

7. Savings from the annual income shall be added to the corpus of the fund.

8. The Syndicate shall administer the endowment and may amend or add to the rules of the award, provided, however, that the funds are not diverted from the object of the endowment.

1941. Dr. R. N. Dandekar.

### **10. The Sachivottama Prize.**

Founder: Mr. C. V. Chandrasekharan, M. A. (Oxon) Pro-Vice-Chancellor of the University

Object: To encourage Technological studies in the University and in the name of Sachivottama Sir C. P. Ramaswami Aiyar, K. C. I. E., K. C. S. I., LL. D., Dewan of Travancore.

Date: November, 1937.

Amount: British Rupees (1,000) one thousand.

#### **RULES OF AWARD.**

1. The Prize shall be called "The Sachivottama Prize."

2. The value of the Prize shall be determined, from time to time by the Syndicate, but shall not exceed the sum realised as annual interest on the corpus.

3. The Prize shall be in the form of books and shall be awarded annually by the Syndicate to the student who stands first among those who qualify for the Diploma in Textile Chemistry.

4. An award may not be made, if in the opinion of the Syndicate there is no suitable candidate.

5. Savings from the annual income shall be added to the corpus of the fund.

6. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

1941—S. Sankaranarayana Iyer.

### 11. The Pitchu Iyengar Prize.

Founder:—Rajyarakshapraveena Mr. R. Pitchu Iyengar, Retired Commissioner of Police, Travancore.

Object:—To encourage technological studies in the University.

Date:—November, 1937.

Amount:—British Rupees (1,000) one thousand.

#### RULES OF AWARD.

1. The Prize shall be called "The Pitchu Iyengar Prize."

2. The value of the Prize shall be determined, from time to time, by the Syndicate, but shall not exceed the sum realised as annual interest on the corpus.

3. The Prize shall be in the form of books and shall be awarded annually by the Syndicate, to the student who stands first among those who qualify for the Diploma in Textile Technology.

4. An award may not be made, if, in the opinion of the Syndicate there is no suitable candidate.

5. Savings from the annual income shall be added to the corpus of the fund.

6. The Syndicate shall administer the endowment and may amend or add to the rules provided, however, that the funds are not diverted from the object of the endowment.

1941—H. Nilakanta Sarma.

### 12. The Muttamma Muthunayagam Memorial Gold Medal.

Founder:—Rao Bahadur A. M. Muthunayagam B. A., B. L., Retired Judge, High Court, Trivandrum.

Object:—To encourage the study of Music, and in memory of his late wife, Mrs. Muttamma Muthunayagam.

Date:—November, 1937.

Amount:—British Rupees (1,000) one thousand.

#### RULES OF AWARD.

1. The Medal shall be called "The Muttamma Muthunayagam Memorial Gold Medal" and shall be made of 22 carat gold.

2. It shall have, on its obverse, the University Coat-of-Arms and, on the reverse, around the circumference, "The Muttamma Muthunayagam Memorial Gold Medal" and the year of award.

3. The Syndicate may decide, from time to time, the cost of the Medal provided that it does not exceed the annual interest on the endowment.

4. It shall be awarded annually, by the Syndicate, to the woman student of the University, who stands first in music in the B. A. Degree Examination and also qualifies for the B. A. Degree at the same time.

5. If, in any year no student satisfies the above conditions, the Medal may be awarded to the woman student who stands first in Music in the Intermediate Examination and passes in all the parts at the same Examination.

6. An award may not be made, if in the opinion of the Syndicate, there is no suitable candidate.

7. Savings from the annual income shall be added to the corpus of the fund.

8. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the use of the funds is not diverted from the object of the endowment.

1941—R. Rajarajeswari Amma.

### 13. The Sachivottama (Dr.) Sir C. P. Ramaswami Aiyar Medal.

Founder:—Mr. V. Varadaraja Iyengar, B. A., B. L., Secretary to the Public Service Commissioner, Trivandrum.

Object:—For the encouragement of literary production in Malayalam and Tamil and in the name of Sachivottama Dr. Sir C. P. Ramaswami Aiyar, K. C. I. E., K. C. S. I., LL. D., Dewan of Travancore.

Date:—November, 1937.

Amount:—British Rupees (750) seven hundred and fifty.

#### RULES OF AWARD.

1. The Medal shall be called "The Sachivottama Dr. Sir C. P. Ramaswami Aiyar Medal" and shall be made of 22 carat gold.

2. It shall have, engraved on its obverse, the University Coat-of-Arms and on the reverse, around the circumference, "The Sachivottama Dr. Sir C. P. Ramaswami Aiyar Medal" and the year of the award.

3. The cost of the Medal shall be determined, from time to time, by the Syndicate and shall not exceed the amount of interest for two years on the endowment.

4. It shall be awarded by the Syndicate, once in two years, for the best literary production in Malayalam and Tamil alternatively, since the date of the previous award.

5. Intending candidates shall submit to the Registrar ten printed copies of the composition before the end of January in the year of the award.

6. The Syndicate may include, for consideration the work of an author who has not applied for the Prize.

7. The Syndicate shall arrange, in consultation with the Dean of the Faculty concerned, for the adjudication of the works.

8. The medal may not be awarded a second time to the same author. An author shall not submit, for consideration, a work in respect of which he has already received some other prize or distinction.

9. The Syndicate may not award the medal if there are no suitable candidates.

10. Savings from the annual income shall be added to the corpus of the fund.

11. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, the funds are not diverted from the object of the endowment.

### 14. Her Highness the Princess Karthika Thirunal Prize.

Founder :—Mr. G. Narayanan Tanpi, B. A., B. L.,  
President, Trivandrum Municipal Council.

Object :—To encourage the study of Music among women students, and in honour of Her Highness Lakshmi Bayi, First Princess of Travancore.

Date :—November, 1937.

Amount :—British Rupees (500) five hundred.

#### RULES OF AWARD.

1. The Prize shall be called "Her Highness the Princess Karthika Thirunal Prize."



2. The value of the Prize shall be determined, from time to time, by the Syndicate, but shall not exceed the sum realised as annual interest on the endowment.

3. The prize shall be in the form of books and shall be awarded annually to the woman student who secure the highest distinction in Music in the year, as judged from the results of the University Examinations.

4. An award may not be made, if, in the opinion of the Syndicate, there is no suitable candidate.

5. Savings from the annual income shall be added to the corpus of the fund.

6. The prize shall not be awarded a second time to the same person.

7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

### 15. His Highness the Elaya Raja Prize.

Founder :— Mr. P. I. Simon, B. A., B. L., Member, Sri Chitra State Council, Trivandrum.

Object :— To encourage athletics among University students in the name of His Highness Martanda Varma, Elaya Raja of Travancore.

Date :— November, 1937.

Amount :— British Rupees (500) five hundred.

#### RULES OF AWARD.

1. The Prize shall be called "His Highness the Elaya Raja Prize."

2. It shall take the form of a silver trophy costing not more than the amount of annual interest on the endowment.

3. It shall be awarded annually by the Syndicate to the athlete who secures the highest number of marks in the Annual University Inter-Collegiate Athletic Meet.

4. An award may not be made, if in the opinion of the Syndicate, there is no suitable candidate.

5. Savings from the annual income shall be added to the corpus of the fund.

6. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

1942—

### 16. The Nagam Aiya Medal.

Founder :— Mr. N. Krishnamurthi, F. R. HIST. S., Private Secretary to His Highness the Maharaja of Travancore.

Object :— For encouraging the study of the History of Kerala, its monarchical traditions and principles, and in the name of his father, the late Dewan Bahadur Mr. V. Nagam Aiya, B. A., F. R. H. S., the first graduate from His Highness the Maharaja's College, Trivandrum.

Date :— November 1937.

Amount :— British Rupees (500) five hundred.

#### RULES OF AWARD.

1. The Medal shall be called "The Nagam Aiya Medal".

2. The Medal shall be made of 22 carat gold, and shall have on its obverse, the University Coat-of-Arms and on the reverse, the inscription 'The Nagam Aiya Medal' and the year of award.

3. The value of the Medal shall be determined by the Syndicate and shall not exceed the amount of annual interest on the endowment.

4. It shall be awarded annually, by the Syndicate to the student who writes the best essay on a subject, relating to the History of Kerala, its monarchical traditions and principles to be prescribed, from year to year, in consultation with the founder. The competition shall be open only to students of the final year Honours Class in History and Economics.

5. The award may not be made when, in the opinion of the Syndicate, there is no suitable candidate.

6. Savings from the annual income shall be added to the corpus of the fund.

7. The Syndicate shall administer the endowment and may amend or add to these rules, provided, however that the funds are not diverted from the object of the endowment.

### 17. Sri Chitra Endowment.

Founder :—The Valiya Raja of Edappalli.

Object :—For the preparation of a Malayalam Lexicon or the acquisition, preservation and publication of old and rare Malayalam Manuscripts and in the name of His Highness Sri Chitra Thirunal, Maharaja of Travancore.

Date :—November 1937.

Amount :—British Rupees (12,000) twelve thousand.

#### RULES OF AWARD.

1. The Endowment shall be called "The Sri Chitra Endowment."
2. The annual interest on the endowment shall be devoted to the preparation of a Malayalam Lexicon or for the acquisition, preservation and publication of old and rare Malayalam Manuscripts.
3. Till such time as the preparation of a Malayalam Lexicon under the auspices of the University is started and provided that the funds are not required for the acquisition of manuscripts, the Syndicate may utilise the income in any manner calculated to promise the development of Malayalam Literature.
4. Savings from the annual income shall be added to the corpus of the fund.
5. The Syndicate shall administer the endowment and may amend or add to the rules provided, however, that the funds are not diverted from the object of the Endowment.

### 18. The Sachivottama Dr. Sir C. P. Ramaswami Aiyar Lecturership.

Founder :—Mr. S. Chidambaram F. I. P. S. (London).

Object :—In honour of Sachivottama Sir C. P. Ramaswami Aiyar K. C. I. E., K. C. S. I., LL. D., Dewan of Travancore, and Vice-Chancellor of the University.

Date :—November, 1937.

Amount :—Rupees (5000) five thousand.

#### RULES OF AWARD.

1. The Lecturership shall be called "The Sachivottama Dr. Sir C. P. Ramaswami Aiyar Lecturership".
2. The Syndicate shall appoint a Lecturer every alternate year to deliver a course of not less than four lectures.
3. The Lecturer may either be selected from among the applicants for the Lecturership or the Syndicate may invite a person of outstanding merit to deliver the course of lectures.
4. The lecture shall be on any topic connected with Public Administration or Indian Art and Architecture.
5. The Lecturer shall be paid an honorarium of Rupees (250) two hundred and fifty only.
6. The Syndicate may publish the text of the lectures in a suitable form or, if it does not decide to do so, may permit the Lecturer to so publish the lecture. A grant, not exceeding Rupees (50) fifty, may be made towards defraying the cost of publication, if and when necessary.

7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

8. If, for any reason, the award is not made in any year, the saving shall be added to the corpus of the fund.

### 19. Mr. S. Krishna Iyer Endowment.

Mr. S. Krishna Iyer, B. A., B. L., M. L. C., Advocate, Kottayam made an endowment at the time of the starting of the University of Travancore, in the form of an annual contribution of Bh. Rs. (1,000) one thousand to be paid by a family trust created for the purpose. The object of the endowment is to promote research work in Agriculture or Applied Science. The rules governing the endowment are as follows :

1. The subject of research to be financed by the endowment shall be decided by the Syndicate in consultation with Mr. Krishna Iyer or his nominee.

2. The amount shall be paid annually and the disbursement shall be made and supervised by the Syndicate.

3. Should, for any reason, the amount of the endowment be not spent during the course of the year, the balance shall be invested by the University in a separate fund, from which grants may be made in aid of research.

4. The first scheme of research shall relate to the problem of retting of coconut husk and the improvement and better utilisation of the products. The scheme shall be governed by the following bye-laws.

(i) A fellowship carrying with it a stipend of Bh. Rs. (50) fifty per mensem shall be created and called "The Krishna Iyer Fellowship.

(ii) The Fellow appointed shall be a graduate in Chemistry with experience of research. He shall be paid at the rate of Rs. 25 per mensem for his travelling expenses and Rs. 100 annually for contingent expenses.

(iii) The Fellow shall examine in detail the conditions of retting of coconut husk at not less than two and not more than three stations. The work of the Fellow shall be supervised by a Committee consisting of the following :—

- (1) Mr. Krishna Iyer or his nominee,
- (2) The Director of Agriculture,
- (3) The Director of Industries, and
- (4) The Director of Research—Convener.

(iv) The Fellow shall make a quarterly report of his progress.

(v) The person appointed may be removed by the Syndicate on the report of the Committee for unsatisfactory progress or misconduct.

5. The above rules and bye-laws may be altered by the Syndicate, only with the consent of Mr. S. Krishna Iyer or his nominee.

1939—Mr. N. Subramania Varier, B. A., M. sc.

1942—Mr. P. George Varghese, M. sc.

### 20. Her Highness the Princess Karthika Thirunal Research Scholarship.

Founder :—Rao Sahib A. S. Alagannan Chettiar, Bodinayakanur.

Object :—To promote research on commercial crops of Travancore, in the name of Her Highness the Princess Lakshmi Bayi Karthika Thirunal.

Date :—November, 1937.

Amount :—British Rupees (10,000) ten thousand.

#### RULES OF AWARD.

1. The Scholarship shall be called 'Her Highness the Princess Karthika Thirunal Research Scholarship. •

2. The monthly value of the Scholarship shall be Rs. (25) twenty-five only.
3. It shall be awarded by the Syndicate to a qualified person belonging to the Devicollam District, for Research Work relating to one of the commercial crops of Travancore.
4. If a properly qualified person satisfying the condition in Rule (3), is not available, the scholarship may be awarded to any qualified candidate.
5. The scholarship shall be tenable for two years in the first instance. It may be renewed for only one further year. No person shall hold the scholarship for more than three years.
6. The award may not be made if, in the opinion of the Syndicate there is no suitable candidate.
7. Saving from the annual income shall be added to the corpus of the fund.
8. The Syndicate shall administer the endowment and may amend or add to the rules, provided however, that the funds are not diverted from the object of the endowment.

## 21. His Highness the Prince Avittam Thirunal Gold Medal.

Founder :—Mr. C. Madhavan Pillai, B. A., B. L., Judge, High Court, Trivandrum.

Object :—To encourage the study of Indian Philosophy and Religion.

Date :—January 1938.

Amount :—British Rupees (1,000) one thousand.

### RULES OF AWARD.

1. The Medal shall be called "His Highness the Prince Avittam Thirunal Gold Medal" and shall be made of 22 carat gold.
2. The Syndicate may decide, from time to time, the cost of the Medal, which shall not exceed the annual interest on the endowment.
3. The Medal shall have, engraved on its obverse, the University coat-of-arms, and, on the reverse, around the circumference, the words "His Highness the Prince Avittam Thirunal Gold Medal" and the year of award.
4. It shall be awarded by the Syndicate to the student who writes the best essay on a subject relating to Indian Philosophy and Religion, the competition being open to students of the degree classes, both pass and honours, of H. H. the Maharaja's Colleges of Arts and Science.
5. The Medal shall not be awarded a second time to the same person.
6. An award may not be made, if, in the opinion of the Syndicate, there is no suitable candidate.
7. Savings from the annual income shall be added to the corpus of the fund.
8. The Syndicate shall administer the endowment and may amend or add the rules, provided, however, that the funds are not diverted from the object of the endowment.

## 22. The Subramonya Karayalar Lecturership.

Founder :—Mr. S. Chattanatha Karayalar, M. A., B. L., Deputy President, Sri Mulam Legislative Assembly, Trivandrum.

Object :—To promote the application of Science to Industry, in memory of his father, the late Rao Sahib Subramonya Karayalar.

Date :—November, 1937.

Amount :—British Rupees (10,000) ten thousand.

### RULES OF AWARD.

1. The Lecturership shall be called "The Subramonya Karayalar Lecturership."
2. The Syndicate shall appoint a Lecturer, every alternate year, to deliver a course of not less than four lectures.

3. The Lecturer may be selected either from among the applicants for the Lecturership, or the Syndicate may invite a person of outstanding merit to deliver the course of lectures.

4. The subject of the lecture shall relate to some scientific problem of economic value.

5. The Lecturer shall be paid an honorarium of Rs. (400) four hundred only.

6. The Syndicate may publish the text of the lectures in a suitable form or, if it does not decide to do so, may permit the Lecturer to publish the lectures. A grant, not exceeding Rupees (200) two hundred may be made towards incidental expenses in connection with the lectures, if and when necessary.

7. The Syndicate may not appoint a lecturer in any year, if a suitable person is not available.

8. Savings from the annual income shall be added to the corpus of the fund.

9. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

### 23. The Kanan Devan Trust.

Founders :—The Kanan Devan Hills Produce Company, Ltd., Travancore.

Object :—Encouragement of post-graduate scientific research in Agriculture and other technical subjects.

Amount :—British Rupees (1,00,000) one lakh.

#### RULES.

1. The endowment shall be called "The Kanan Devan Trust."

2. The interest on the endowment shall be used in any or all of the following ways :—

(a) Grants-in-aid.

(b) Award of Prizes and Medals.

(c) Award of Scholarships and Fellowships.

At present provision is made for one prize, three scholarships and three Fellowships, to be awarded in accordance with the rules of award given below.

3. In the administration and management of the endowment, the Syndicate shall be advised and assisted by a Committee styled "The Kanan Devan Hills Produce Company Endowment Committee consisting of:—

(i) A nominee of the Government of Travancore.

(ii) The Pro-Vice Chancellor or when there is no Pro-Vice-Chancellor, the Vice-Chancellor.

(iii) The General Manager of the Kanan Devan Hills Produce Company, Ltd., or his nominee.

(iv) and (v) Two members nominated by the Syndicate.

4. The statement of accounts relating to the endowment shall be forwarded annually to the General Manager of the Kanan Devan Hills Produce Company Ltd., Munnar.

5. The savings from the annual income shall be added to the corpus of the endowment, provided, however, that the Syndicate may, with the approval of the Kanan Devan Hills Produce Company Endowment Committee, utilize the like savings of any year for the award of grant-in-aid of research on technical subjects.

6. The Syndicate may not make any of the awards if there are no suitable candidates.

7. The Syndicate may, with the approval of the Kanan Devan Hills Produce Company Endowment Committee, amend or add to these rules of award given below:—

## Rules of Award.

### (a) THE KANAN DEVAN PRIZE.

1. The Prize shall be called "The Kanan Devan Prize."
2. It shall be awarded in the form of cash amounting to British Rs. (300) three hundred every year to a Travancorean for the best scientific monograph dealing with the practical applications of scientific research to Agriculture in the State.
3. The award of any year shall be made in the month of November in the succeeding year.
4. Intending candidates shall submit to the Registrar ten printed copies of the work before the end of January in the year of award.
5. The Syndicate may include for consideration the work of an author who has not applied for the Prize.
6. The Syndicate shall arrange, in consultation with the Dean of the Faculty of Science and the Kanan Devan Hills Produce Company Endowment Committee, for the adjudication of the works.
7. The Prize may not be awarded a second time to the same author. An author shall not submit for consideration a work in respect of which he has already received some other prize or other distinction.

### (b) THE KANAN DEVAN SCHOLARSHIPS.

1. The Scholarships shall be called "The Kanan Devan Scholarships.
2. The monthly value of the stipend accompanying each Scholarship shall be Rs. 25 (twenty-five) only.
3. The Scholarship shall be awarded by the Syndicate, in consultation with the Kanan Devan Hills Produce Company Endowment Committee, to qualified Travancoreans engaged in research work in Agriculture. Each Scholarship shall be tenable for one year, in the first instance and may be renewed for one more year. No person shall hold a Scholarship for more than two years.
4. The Scholarships shall not be held by persons conjointly with any other Scholarships.
5. All or any of the Scholarships may be stopped at any time for unsatisfactory progress or misconduct.
6. The Scholarships shall ordinarily be awarded at the beginning of an academic year. If, for any reason, any of the Scholarships falls vacant in the course of an academic year, it shall be awarded at the commencement of the next academic year.

1941th Mr. C. K. Narayanan Nair B. Sc.,

### (c) THE KANAN DEVAN FELLOWSHIPS

1. The Fellowships shall be called "The Kanan Devan Fellowships".
2. The monthly value of the stipend accompanying each Fellowship shall be Rs. (50) fifty only.
3. The Fellowships shall be awarded by the Syndicate, in consultation with the Kanan Devan Hills Produce Company Endowment Committee, to qualified Travancoreans engaged in scientific research work in Agriculture or the allied subject. Each Fellowship shall be tenable for one year in the first instance and may be renewed for one more year. No person shall hold a Fellowship for more than two years.
4. The Fellowships shall not be held by persons conjointly with other Fellowships or Scholarships.
5. All or any of the Fellowships may be stopped at any time for unsatisfactory progress or misconduct.
6. The Fellowships shall ordinarily be awarded at the beginning of an academic year. If, for any reason, any of the Fellowships falls vacant in the course of an academic year, it shall be awarded at the commencement of the next academic year.

1941. Messrs. T. J. Koshy Msc. and K. Kesavan Nair Msc.

### 24. The Sachivottama Shashtia bapurthy Memorial Medal.

**FOUNDER:**—Mr. Elanjikal Thariath Kunjithommen, M. L. A., Landlord and Planter, Kothamangalam, North Travancore.

**OBJECT:**—To encourage public speaking in Malayalam among University students and in commemoration of the Shashtiabapurthy of Sachivottama Sir C. P. Ramaswami Aiyar, K. C. I. E., K. C. S. I., LL. D. Dewan of Travancore and Vice-Chancellor of the University.

**DATE:**—11th November 1939.

**AMOUNT:**—British Rs. (1,000) one thousand.

#### RULES OF AWARD.

1. The Medal shall be called "Sachivottama Shashtiabapurthy Memorial Medal" and shall be made of 22 carat gold.
2. It shall have, engraved on its obverse, the University coat-of-arms and, on the reverse, around the circumference, the words "Sachivottama Shashtiabapurthy Memorial Medal" and the year of award.
3. The cost of the Medal, which shall not exceed the amount of annual interest on the endowment, shall be determined by the Syndicate from time to time.
4. The Medal shall be awarded annually by the Syndicate to the student who stands first in a public debate in Malayalam to be held under the auspices of the University.
5. The Medal shall not be awarded a second time to the same person.
6. Savings from the annual income shall be added to the corpus of the fund.
7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the use of the fund is not diverted from the object of the endowment.

1941 M. Stephen B. A. (Law College)

### 25. The Andhra University Medal.

1. The Andhra University Medal is instituted to commemorate the visit to the Andhra University of His Highness Sri Chitra Thirunal Sir Bala Rama Varma, Maharaja of Travancore, and Her Highness Setu Parvati Bayi Maharani of Travancore, and Their Highness' connection with that University as its Life Members.
2. The endowment consists of Rs. 2,000 paid to the University of Travancore by the Andhra University and the interest on this amount shall be utilised for the annual award of a Gold Medal.
3. The Medal shall be called the "Andhra University Medal" and shall bear on it the crest of the Andhra University.
4. The Medal shall be awarded to the candidate, who, in the opinion of the Syndicate of the Travancore University, has shown conspicuous merit in research work in Physics or Chemistry.
5. Only teachers and students of the University of Travancore shall be eligible for the Medal.
6. If, in any year, the Medal be not awarded, the unexpended interest shall be added to the corpus of the fund.
7. The Syndicate of the Travancore University shall be competent to frame such additional rules not inconsistent with these, as may be found necessary to regulate the award of the Medal.

### 26. The Kerala Scholarship.

**FOUNDER:** Mr. Lindsay F. Johnson, Quilon.

**OBJECT:** To promote the study of Industrial Chemistry or Chemical Engineering.

**DATE:** November, 1937.

**AMOUNT:** British Rs. (5,000) five thousand.

## RULES OF AWARD.

1. The Scholarship shall be called "The Kerala Scholarship."
2. The monthly value of the Scholarship shall be Rs. (12) twelve
3. It shall be awarded by the Syndicate to a student for the Diploma Course in Textile Chemistry on the results of the examination at the end of the first year's course and shall be tenable during the rest of the course of instruction.
4. The Scholarship shall be forfeited on grounds of misconduct, irregularity, unsatisfactory progress or failure in University Examinations.
5. If the Scholarship falls vacant during the course of an academic year, it may be awarded to the next best student in the same class.
6. No award may be made, if there are no suitable candidates.
7. Savings from the annual income shall be added to the corpus of the fund.
8. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment. The rules shall, in any case, be reviewed by the Syndicate and, if necessary, altered when Chemical Engineering is introduced as a subject of study in the University.

1940—41 K. Geevarghese.

## 27. The Endowment by Her Highness the Maharani of Bikaner.

FOUNDER :—Her Highness the Maharani of Bikaner.

OBJECT :—For the annual award of a prize in H. H. the Maharaja's College for Women, for proficiency in Music.

DATE :—29th January, 1939.

AMOUNT :—Bh. Rs. (200) Two hundred only.

## RULES OF AWARD.

1. The prize shall be called "Her Highness the Maharani of Bikaner Prize for Music" and shall be awarded in the form of books on Music.
2. The value of the prize shall be fixed by the Syndicate from time to time and shall not exceed the annual interest on the endowment.
3. It shall be awarded annually by the Syndicate, to the student who, among the students presented from the College for Women, passes at the first appearance the Intermediate Examination of the University, securing the highest marks in Music.
4. Only subjects of His Highness the Maharaja of Travancore are eligible for the prize.
5. Savings from the annual income on the endowment shall be added to the corpus of the fund.
6. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the use of the fund is not diverted from the object of the endowment.

1941—R. Rajarajeswari Amma.

## 28. The Meenaksbi Amma Medal.

FOUNDER :—Mr. K. Narayana Menon, B. A., B. L., Retired Dewan Peishkar, Trivandrum.

OBJECT :—To encourage higher education among women, and in the name of Srimathy Meenakshi Amma, wife of the Founder.

DATE :—November, 1937.

AMOUNT :—British Rupees (1,000) one thousand.

## RULES OF AWARD.

1. The Medal shall be called "The Meenakshi Amma Medal."
2. The value of the Medal shall be determined, from time to time, by the Syndicate, but shall not exceed the sum realised as annual interest on the corpus.



3. The Medal shall be awarded annually, by the Syndicate, to the student who, among the lady students of the year, passes highest in the B. A. (Hons.) or M. A. Degree Examination in Malayalam or obtains the highest number of marks in Malayalam under Part II—Second Language—in the B. A. or B. Sc., Degree Examination of the University, preference being given to candidate passing the B. A. (Hons.) or M. A. Degree Examination.

4. An award may not be made, if, in the opinion of the Syndicate, there is no suitable candidate.

5. Savings from the annual income shall be added to the corpus of the fund.

6. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

1941—S. Shanmukhom Ammal B. A., (College of Arts.)

### 29. Her Highness Maharani Setu Parvati Bayi Prize.

FOUNDER :—Mr. K. Narayanar Pandarathil, Mulapuzhamun Madom, Vallamkulam, Thiruvella.

OBJECT :—To encourage the study of "Jyotishakala" (Astronomy) in the University and in memory of Her Highness Maharani Setu Parvati Bayi.

DATE :—28th April, 1939.

AMOUNT :—Rs. (1,000) one thousand.

#### RULES OF AWARD.

1. The Prize shall be awarded in the form of books and shall be called "Her Highness Maharani Setu Parvati Bayi Prize."

2. The value of the Prize shall be fixed by the Syndicate from time to time, but shall not exceed the amount of annual interest on the endowment.

3. It shall be awarded annually by the Syndicate to the B. Sc. student of the University, who, being a subject of His Highness the Maharaja of Travancore, does Astronomy for his B. Sc. Course and passes the B. Sc. Degree Examination at the first instance with the highest mark in Astronomy.

4. Savings from the annual income shall be added to the corpus of the fund.

5. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the use of the fund is not diverted from the object of the endowment.

### 30. The Sachivottama Shashtiabdapurthy Memorial Prize.

FOUNDER :—K. A. Sainuddin, Esq., Advocate, Trivandrum.

OBJECT :—To encourage studies in Law in memory of Sachivottama (Dr.) Sir C. P. Ramaswamy Aiyar.

AMOUNT :—Bh. Rs. (500) Five hundred.

DATE :—November, 1939.

#### RULES OF AWARD.

1. The Prize shall be called "The Sachivottama Shashtiabdapurthy Memorial Prize" and shall be awarded annually in the form of books on Law or cash at the option of the candidate.

2. The value of the prize shall be determined from time to time, by the Syndicate, but shall not exceed the annual interest on the endowment.

3. The Prize shall be awarded by the Syndicate to the student who, being a subject of His Highness the Maharaja of Travancore, passes highest in the First Examination in Law of the University after the minimum course of study for the examination.

4. Savings from the annual income shall be added to the corpus of the Fund.

5. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

1941—K. Sridharan Pandalai.

### 31- The N. Krishnaswamy Aiyar Memorial Gold Medal.

The endowment consists of subscriptions collected from the students and friends of the late Professor N. Krishnaswamy Aiyar, Professor of Chemistry, H. H. the Maharaja's College, Trivandrum, by the Professor N. Krishnaswamy Aiyar Memorial Committee.

**OBJECT :—**To encourage the study of Chemistry in the University and in memory of the late Professor N. Krishnaswamy Aiyar.

**DATE :—**April 1941.

**AMOUNT :—**Bh. Rs. (1,150) one thousand one hundred and fifty.

#### RULES OF AWARD.

1. The Medal shall be called "The N. Krishnaswamy Aiyar Memorial Gold Medal" and shall be of 14 carat gold.

2. The Syndicate may decide from time to time the cost of the Medal, provided that it does not exceed the annual interest on the endowment.

3. The Medal shall have on its obverse, the University Coat-of-Arms and, on the reverse, around the circumference, the words "Prof. N. Krishnaswamy Aiyar Memorial Gold Medal" and the year of the award.

4. It shall be awarded by the Syndicate every year to the candidate who stands first among those qualifying during the year for the degree of Bachelor of Science (Pass) with Chemistry as the Main subject for Part III of the Examination.

5. The award may not be made, if, in the opinion of the Syndicate, there is no suitable candidate.

6. Savings from the annual income shall be added to the corpus of the fund.

7. The Syndicate shall administer the endowment and may amend or add to the rules, provided, however, that the funds are not diverted from the object of the endowment.

1940—K. G. Rishikesa Pisharodi B. Sc.

1941—V. T. George B. Sc.

**Other Endowments, rules relating to which are under preparation.**

Donor.	Amount donated.	Purpose.
	Bh. Rs.	
32. Mr. Puthuppally S. Krishna Pillai, B. A., B. L., M. L. A., President, Nayar Service Society	50,000	Towards the starting of the N. S. S. College of Oriental Studies including Kerala Art and Culture, in the name and on behalf of the Nayar Service Society.
33. Mr. P. T. Thomas, Palampadam Estate, Kottayam	25,000	The institution of scholarships for research in Agriculture in the University of Travancore.
34. The Princess Karthika Thirunal Theatre Fund Committee	20,764-12 14 (and odd)	The construction of a theatre, named after Her Highness Princess Karthika Thirunal, in the University grounds.
35. Srimathy R. Lakshmi Ammal, Dikshithar Street, Fort, Trivandrum	10,000	The institution of a Studentship for the encouragement of studies in Agriculture among Mukkani Brahmins, in memory of her great grand-father, the late Fouzdari Commissioner, Mr. S. Anantharama Iyer.
36. Mr. T. V. Krishna Iyer, Vadi-veeswaram, Nagercoil	10,000	
37. Mr. P. V. Swaminathan, Cashewmead, Quilon	10,000	Towards the establishment of a Department of Electrical Engineering in the University.
38. Mr. P. S. R. Chari, Builder and Contractor, Trivandrum	1,500	The institution of a medal to encourage the development of industries in the State, in the name of Her Highness the Maharani Setu Parvati Bayi, D. Litt.
39. Mr. Malloor K. Govinda Pillai, B. A., B. L., Advocate, Trivandrum	1,200	The institution of a gold medal for the encouragement of Physical Culture in the University, in the name of his wife.
40. Mr. E. J. Philipose, B. A., B. L., Advocate, Trivandrum	1,000	For general purposes.

Donor.	Amount donated.	Purpose.
	Bh. Rs.	
41. Mr. K. M. Mathulla, B. A. Managing Director. The City Bank, Ltd., Trivan- drum	500	The institution of a prize for the en- couragement of the study of Com- mercial subjects in the B. A. classes of the University, in the name of His Highness Sri Chitra Thirunal, Maharaja of Travancore.
42. The Travancore officers' Association (defunct)	1918-10-14	For helping some deserving student preferably, a son or daughter of an officer, who would have been eligible for membership of the Association.
43. The Travancore University Muslim Endowment com- mittee	50,000	For encouraging Islamic studies in the University.
44. Vaidyasastranipuna Dr. L. A. Ravi Varma	500	
45. Mr. V. Varadaraja Aiyangar District Munsiff N. Parur	750	For the institution of a Fine Arts Medal in the name of H. H. the Maharaja.

**Rules regarding the administration of the Travancore University Research Endowment Fund.**

A number of donors having contributed various amounts for general purposes, the Syndicate has decided that these donations, together should constitute a progressively increasing corpus, the annual interest from which may be utilised for furthering the aims and objects of the University. The under mentioned donations are included in this fund :—

Donor.	Amount.	Date.	Object.
1. Messrs. The Travancore Minerals Company Ltd.	£ 1,000 (S. Rs. 13571-12 ch.)	Nov. 1937	Establishment of a Department of Scientific Research in the University.
2. Messrs. Harrisons and Crossfield Ltd., Quilon.	B. Rs. 12492-3 as.	Do.	Do.
3. Captain V. Padmanabhan Tampi, Bellehaven, Trivandrum.	B. Rs. 10000-0-0	Do.	For general purposes.
4. Mr. A. V. Thomas, Beach Road, Alleppey.	B. Rs. 10000-0-0	Do.	Do.
5. Dr. K. K. Pandalai, (Retired Judge, Madras High Court) Mavelikara.	B. Rs. 1000-0-0	Do.	Do.
6. Mr. K. Venkitaraman, Bombay.	B. Rs. 821-0-10	April 1938	Do

1. For the present this fund shall be called "The Travancore University Research Endowment Fund" and the annual income shall be used in any or all of the following ways :—

- (i) Grant-in-aid for the purchase of equipment, books and appliances for research purposes.
- (ii) Grant-in-aid of publication of Original research.
- (iii) Stipends to research workers to defray cost of living or fees for working in places outside the jurisdiction of the University.
- (iv) Travelling Scholarships.

2. The Syndicate may not make any award in an year if there is no suitable applicant. The unspent portion of the income in any year shall be added to the corpus.

3. Grants shall be made by the Syndicate, ordinarily, on the recommendation of the Dean of the Faculty and the Head of the Department of study concerned.

4. The Syndicate may fix the amount and conditions of each award and may require the recipient to enter into a bond with the University the terms of which may be settled by the Syndicate.

5. The recipient of an award shall hand over to the University unless otherwise decided by the Syndicate all equipment, books and appliances purchased with the help of the grant.

6. It shall be obligatory for the recipient to acknowledge the aid when publishing a work in respect of which the grant was given and to furnish to the University free of cost, four copies of the publication.

7. The Syndicate may make any change that is considered necessary in these rules.

## APPENDIX II.

## Syllabuses and Text Books.

## INTERMEDIATE EXAMINATIONS.

## MATHEMATICS.

## REVISED SYLLABUS.

In addition to the subjects prescribed for the E. S. L. C. Examination, the course shall comprise Algebra, Plane Trigonometry, Geometry and Calculus. A candidate shall be required to be acquainted with the use of logarithmic tables and to be able to solve questions by graphic methods.

(a) **ALGEBRA**.—Algebraical laws and their applications. Remainder theorem. Ratio and Proportion. Theory of Indices. Simple surds. Theory of Equations and expressions of the second degree in one variable. Solution of equations reducible to the quadratic. The three progressions and other series whose summation depends on Arithmetic and Geometric series. Value of  ${}^nP_r$  and  ${}^nC_r$  (under Permutations and Combinations). The Binomial Theorem for a positive integral exponent. Elementary theory of logarithms and their applications to arithmetical computation. Uses of the general Binomial, Exponential and Logarithmic series for purposes of approximation. Problems on the above.

(b) **PLANE TRIGONOMETRY**.—Measurement of angles. Trigonometrical functions and their relations to one another. Solution of simple trigonometrical equations. Compound angles, multiple and sub-multiple angles and their applications. Properties of triangles and of the circles connected with them (omitting distances between special points). Solution of triangles. Application of logarithms to trigonometrical computations. Measurements of heights and distances. Elementary Trigonometric series.

(c) **PURE GEOMETRY**.—(i) **EXPERIMENTAL**.—Constructions of scales and their use. Construction of similar figures. Construction of the circumscribed, inscribed, escribed circles of triangles and polygons. Construction from data of triangles and polygons, and their division in any given ratio. Construction of circles. Areas of polygons and problems relating thereto.

(ii) **THEORETICAL**.—Ratio and proportion, similar figures. Currency and Collinearity. Properties of triangles. Properties of Circles. Loci. Inversion. Proofs of the constructions in Experimental Geometry. Easy deductions.

(d) **ANALYTICAL GEOMETRY**.—Cartesian rectangular co-ordinates of a point. Distance between two given points. Equation of a straight line (1) in terms of its slope and the intercept made on the Y-axis (2) passing through a given point and having a given slope; (3) passing through two given points; (4) in terms of the perpendicular from the origin on the line and the inclination of the perpendicular to the X-axis; (5) in terms of the intercepts on the axes. Co-ordinates of the point of intersection of two straight lines. Perpendicular from a point to a line. Angle between two lines. Conditions for parallelism and perpendicularity. Pairs of straight lines through the origin. Equation of a circle. Tangent to a circle.

(e) **CALCULUS**.—Graphical idea of a function. Idea of a limit (intuitive and not rigorous).

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} \quad (n \text{ being a positive integer}); \quad \lim_{x \rightarrow a} \frac{\sin x}{x}$$

Definition of differential coefficient, Differential Coefficient of a constant,  $\frac{d}{dx} x^n$  ( $n$  positive integer)  $\cos x$ ,  $\sin x$ . Derivative of the sum of two functions, Derivative of the product of two functions. Derivative of a function of a function, Derivative of the second order.

Geometrical interpretation of the derivative. Gradient of a curve. Equations of the tangent and normal. Mean value theorem (Graphical proof).

Graphical treatment of the maxima and minima of functions of one variable. The following criteria to be obtained from graphical considerations only (no proof required).

If  $f'(a)=0$ ,  $f''(a) < 0$ , then  $f(a)$  is a maximum value of  $f(x)$ .

If  $f'(a)=0$ ,  $f''(a) > 0$ , then  $f(a)$  is a minimum value of  $f(x)$ .

Simple examples involving the above criteria.

Derivative as a rate-measurer. Velocity and acceleration expressed as differential coefficients.

Integration regarded as reverse of differentiation. Indefinite integrals. Easy applications to areas under plane curves. Easy application to volumes of simple solids of revolution, the generating curve not cutting the axis of revolution.

(Candidates are not expected to do any complicated differentiation nor will they be expected to integrate any functions other than polynomials,  $a \cos bx$ ,  $a \sin bx$ ,  $a$ ,  $b$ , constants).

#### DETAILED SYLLABUS IN THEORETICAL GEOMETRY.

N. B.—The order in which the theorems are stated in this syllabus is not imposed as the sequence of their treatment.

RATIO AND PROPORTION.—Definition and elementary theorems connecting the antecedents and consequents.

A given straight line can be divided internally in a given ratio at one, and only one point, and externally at one, and only one point.

A straight line drawn parallel to one side of a triangle cuts the other two sides, or those sides produced, proportionally, and the converse.

If the vertical angle of a triangle is bisected internally or externally the bisector divides the base internally or externally into segments which have the same ratio as the other sides of the triangle, and the converse.

In equal circles, angles whether at the centres or circumferences, have the same ratio as the arcs on which they stand.

Triangles and parallelograms of equal altitude are to one another as their bases.

If two triangles have one angle of the one equal to one angle of the other, their areas are proportional to the rectangles contained by the sides about the equal angles. Similarly for parallelograms having one angle of the one equal to one angle of the other.

SIMILAR FIGURES.—If two triangles are equiangular their corresponding sides are proportional; and the converse.

If two triangles have one angle of the one equal to one angle of the other and the sides about these equal angles proportional, the triangles are similar.

Two triangles are similar, if the sides of the one are respectively parallel or perpendicular to the sides of the other.

If two triangles have two sides of the one proportional to two sides of the other and an angle in each opposite one corresponding pair of these sides equal, the angles opposite the other pair are either equal or supplementary.

If from the right angle A of a right-angled triangle ABC, AD is drawn perpendicular to BC, then (1) AD is the mean proportional between BD and DC, (2) BA is the mean proportional between BD and BC and (3) CA is the mean proportional between CB and CD.

If two triangles are similar, their corresponding lines (such as medians, altitudes, inradii, etc.) are to one another in the ratio of their corresponding sides.

Areas of similar triangles are to one another as the squares on their corresponding sides.

Two similar and similarly placed polygons can be divided into the same number of triangles similar to each other and similarly placed; and the converse.

The perimeters of two similar polygons are to each other as any corresponding sides.

Areas of similar polygons are proportional to the squares on corresponding sides.

**CONCURRENCY AND COLLINEARITY.**—The use of signs as applied to lines, angles and areas. If two parallel lines are cut by three or more concurrent transversals, the corresponding segments are proportional; and the converse.

If  $X, Y, Z$ , are points in the sides  $BC, CA, AB$  of a triangle  $ABC$ , such that the perpendiculars to those sides at these points are concurrent, then

$$BX^2 + CY^2 + AZ^2 = CX^2 + BZ^2 + AY^2,$$

and the converse.

If any transversal meets the sides  $BC, CA, AB$ , of a triangle in  $D, E, F$ , then,  
 $AF \cdot BD \cdot CE = AE \cdot CD \cdot BF$ ;

and conversely, if three points  $D, E, F$  taken on the sides  $BC, CA, AB$  of a triangle, satisfy the relation  $AF \cdot BD \cdot CE = AE \cdot CD \cdot BF$ , then  $D, E, F$ , are collinear.

If the lines joining any point of the vertices  $A, B, C$  of a triangle meet the opposite sides in  $D, E, F$ ;

$$\text{then } AF \cdot BD \cdot CE = FB \cdot DC \cdot EA :$$

and conversely, if three points  $D, E, F$ , taken on the sides  $BC, CA, AB$  of a triangle, satisfy the relation  $AF \cdot BD \cdot CE = FB \cdot CD \cdot EA$ , then  $AD, BE, CF$ , are concurrent.

If two unequal similar figures are similarly placed, the lines joining the vertices of one to the corresponding vertices of the other are concurrent.

**PROPERTIES OF TRIANGLES.**—The three medians of a triangle meet in a point, and this point is a point of trisection of each median, and also of the line joining the circumcentre to the orthocentre.

If  $D$  is a point in the side  $BC$  of a triangle  $ABC$  such that  $BD = \frac{1}{n} BC$ , then  
 $(n-1) AB^2 + AC^2 = n \cdot AD^2 + (1 - \frac{1}{n}) BC^2$ .

The perpendiculars from the vertices of a triangle on the opposite sides meet in a point, and the distance of each vertex from the orthocentre is twice the perpendicular distance of the circumcentre from the side opposite to that vertex.

The circle through the middle points of the sides of a triangle passes also through the feet of the perpendiculars of the triangle and through the middle points of the three lines joining the orthocentre to the vertices of the triangle.

If a perpendicular drawn from the vertex to the base of a triangle is produced to meet the circumcircle, then the distance of this point of intersection from the base is equal to the distance of the orthocentre of the triangle from the base.

The feet of the perpendicular drawn on the sides of a triangle from any point  $P$  on the circumcircle of that triangle are collinear.

The pedal line of  $P$  bisects the line joining  $P$  to the orthocentre of the triangle.

If the vertical angle of a triangle is bisected by a straight line which cuts the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the segments of the base together with the square on the straight line which bisects the angle.

If from the vertical angle of a triangle a straight line is drawn perpendicular to the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the perpendicular and the diameter of the circle described about the triangle.



**PROPERTIES OF CIRCLES.** The locus of the points of intersection of tangents drawn at the extremities of chords of a circle which pass through a fixed point, is a straight line.

If the polar of A passes through B, then the polar of B passes through A.

If P and Q are any two points in the plane of a circle whose centre is O, then OP bears to OQ the same ratio as the perpendicular from P on the polar of Q bears to the perpendicular from Q on the polar of P.

The locus of points from which the tangents to two given coplanar circles are equal is a line perpendicular to the line of centres.

In two circles, if any two parallel radii are drawn (one in each circle), the straight line joining their extremities cuts the line of centres in one or other of two fixed points called centres of similitude.

If through a centre of similitude of two circles, a line is drawn cutting the circles, the radii to a pair of corresponding points are parallel.

In a cyclic quadrilateral the rectangle contained by the diagonals is equal to the sum of the rectangles contained by the pairs of opposite sides.

If A, B are fixed points, and P a variable point such that the ratio of PA to PB is one of constant inequality, then the locus of P is a circle.

Given the base and vertical angle of a triangle, find the locus of (1) its incentre (2) orthocentre, (3) centroid, (4) excentres.

#### TYPES OF PROBLEMS IN CALCULUS WHICH DEFINE THE STANDARD.

1. Differentiate with respect to  $x$  :  $x \sin x$ ,  $\cos^2 x$ .
2. If  $y = (2x-1)(3x^2 + 1)$  find  $\frac{d^2 y}{dx^2}$
3. If  $y = a \cos nx + b \sin nx$ , where  $a$ ,  $b$ ,  $n$  are constants prove that  $\frac{d^2 y}{dx^2} + n^2 y = 0$
4. Find the points on the curve  $y = x^3 - 2x^2 + x$  at which the tangent is parallel to the X axis.
5. Find the gradients of the curve  $y = x^3 - 6x^2 + 11x - 6$  at the points (1, 0), (2, 0) (3, 0).
6. Find the equation of the tangent to the curve  $y = 3x^3 + 2x + 1$  at the point on it where  $x = 1$ .
7. A particle projected vertically upward rises  $s$  feet in  $t$  seconds where  $s = 80t - 16t^2$ . What is the greatest height reached by the particle.
8. A rectangular sheet of metal is 8 ft. by 3 ft. Equal squares are cut off at each of the corners, and the flaps are then folded up to form an open rectangular box. Find the side of the squares cut off so as to make the volumes of the rectangular box a maximum.
9. A stone thrown up into the air rises  $s$  feet in  $t$  seconds where  $s = 50t - 16t^2$ .

What does  $\frac{ds}{dt}$  represent? What is its value when  $t = 1$ ? What is the

meaning of a negative value of  $\frac{ds}{dt}$ ?

10. Express in symbols using the notation of the differential co-efficient.—

(i) The rate of change of the area  $A$  sq. in. of a circle with respect to its radius  $r$  inches is proportional to  $r$ .

- (ii) The angular velocity of a rotating body is proportional to the angle turned through  $t$  seconds after starting.
11. A particle has a uniform acceleration  $f$  in a straight line and covers a distance  $s$  in time  $t$  seconds, when its velocity is  $v$ . Find the relation between  $s$  and  $t$  given that initially (when  $t=0$ )  $s=0$  and  $v=u$ .
12. Find  $y$  in terms of  $x$  if  $\frac{dy}{dx}=x^2$  and  $y=1$  when  $x=1$ .
13. Find  $\int (x^2 + x + 1) dx$ ,  $\int 2 \cos 3x dx$ ,  $\int_0^{\frac{\pi}{2}} (\sin x + \cos x) dx$ .
14. Find the area bounded by the curve  $x^2=4y$ , the  $x$  axis and the ordinate  $x=h$ .
15. Assuming that the circumference of a circle of radius  $r$  is  $2\pi r$  but not assuming the formula for the area of a circle, prove that the area enclosed between two concentric circles of radius  $r$  and  $r + \Delta r$  ( $\Delta r > 0$  and is small) is approximately  $2\pi r \Delta r$ . Deduce by integration that the area of the circle with radius  $r$  is  $\pi r^2$ .
16. Find the area enclosed by the  $x$ -axis and one arc of the curve  $y=\sin x$ .
17. A segment of height  $h$  is cut off from a sphere of radius  $a$ . Find the volume of the segment.

TYPES OF PROBLEMS IN ANALYTICAL GEOMETRY WHICH DEFINE THE STANDARD.

1. Show that the points  $(9, 3)$ ,  $(7, 1)$ ,  $(1, 1)$  are equidistant from the point  $(4, 3)$ .
2. Find the gradients of the following lines and the intercepts made by them on the  $Y$ -axis ;  
 (i)  $y=3x+4$ .  
 (ii)  $3x+5y-4=0$ .
3. Show that the lines  $3x-4y+5=0$ ,  $6x-8y+1=0$  are parallel.
4. Show that the lines  $4x-5y+6=0$ ,  $5x+4y-7=0$  cut at right angles.
5. Find the equation of the lines through  $(4, 5)$  making an angle of  $60^\circ$  with the  $X$ -axis.
6. Find the equation of the line through  $(4, 5)$  cutting off an intercept of  $+3$  on the  $Y$ -axis.
7. Find the equation of the line through  $(3, 2)$  and  $(2, -7)$ . Find its slope.
8. Show that for all values of  $a$  the line  $y-3=a(x-2)$  passes through a fixed point. What is  $a$  if the line passes through  $(4, 5)$ .
9. Find the equation of the line through  $(2, 3)$  parallel to  $2x-5y+14=0$ . What is the equation of the line through  $(2, 3)$  perpendicular to  $2x-5y+14=0$ .
10. Show that the lines  $3x+4y=13$ ,  $2x-7y+1=0$ ,  $3x-y=14$  are concurrent. Find the point of concurrence.

11. Find the mid-points of the sides of a triangle whose vertices are at (5, 3), (3, 8), (4, 11), Find the equations of the medians.
12. Show that the points (3, 4), (0, 5), (-3, -1), (-5, 0) lie on a circle whose centre is the origin. What is the radius of the circle?

## PHYSICS.

1943 and 1944.

### THEORY.

No question shall be asked which cannot be answered by simple mathematical methods.

The course shall include a more detailed study of the matter included in the E. S. L. C. syllabus and, in addition, the following :

**DYNAMICS.** The units of length and time. Displacement, speed, velocity and acceleration of a particle moving in a straight line. Newton's laws of motion ; the units of mass and force. Motion of a particle in a straight line under the action of a force in that line. Motion under the action of gravity. Energy-work, power and their units ; simple illustrations of the conservation of energy.

Conditions of equilibrium of a body under three concurrent forces (the parallelogram law), and under parallel forces. Centre of gravity. Simple machines. The simple pendulum ; determination of  $g$ .

**HYDROSTATICS.** Pressure at a point in a fluid ; definition and illustrations ; transmissibility of pressure. Evaluation of pressure at a point in a heavy fluid at rest ; its uniformity in all directions. Resultant thrust in simple cases. The principle of Archimedes ; floating bodies, and hydrometers. Applications to practical determination of density and specific gravity. The pressure of a gas and its determination ; the barometer. Boyle's law. Air pumps and water pumps.

**HEAT.** Temperature and its measurement ; the construction and graduation of thermometers. The thermal expansion of solids, liquids and gases and their accurate determination ; the air thermometer. Heat as a quantity ; the unit of heat. Specific heat and the more direct methods of calorimetry. Laws of fusion, evaporation and ebullition ; latent heat. Vapour pressure and how it is measured ; hygrometers. Conduction and convection of heat ; thermal conductivity. Radiation ; absorption and reflection ; Newton's law of cooling. The dynamical equivalent of heat and its determination.

**LIGHT.** Photometry. The experimental facts and laws of transmission, reflection and refraction of light ; simple geometrical deductions from these applicable to small direct pencils incident on plane and spherical surfaces, prism and lenses. Applications to optical lanterns, spectacles, telescope and microscope. Total reflection. Critical angle. Dispersion of light ; the spectrometer. Emission spectra. Determination of refractive indices.

**MAGNETISM.** Properties of magnets—poles. Laws of magnetic force ; unit poles. Lines of force ; uniform magnetic fields and experimental methods of comparing them. The earth's magnetic field : the compass. Magnetic induction ; the magnetic properties of iron and steel.

**ELECTRICITY.** Electrification by friction and induction. Gold leaf electroscope. Positive and negative charges. Laws of attraction and repulsion. Distribution of charge on conductors. Action of points. Qualitative ideas of electric field and potential. The Leyden Jar—Simple induction machines such as the electrophorus. The more common forms of primary cells and their principles of working.

The action of currents on magnets and vice-versa ; galvanometers depending on such action including suspended coil type. Metallic conductors and electrolytes ; laws of electrolysis. Comparison of E. M. F's by the potentiometer. Ohm's law. Simple methods of measuring current and resistance. Wheatstone's bridge. Heating effects of current ; fuses and lamps ; Joule's law. The electromagnet. Simple ideas of E. M. induction. Dynamo, Motor, Microphone and Telephone.

**SOUND :** The production and propagation of sound ; the velocity of sound in air and its determination. Nature of wave motion and sound waves. Frequency of vibration ; pitch. Amplitude of vibration ; loudness. The reflection of sound ; echoes.

Laws of vibration of strings and air columns.

N. B. An asterisk\* before a paragraph means that for the topics included only experimental proofs are required.

#### PRACTICAL PHYSICS FOR THE INTERMEDIATE COURSE.

The list of experiments given below is not exhaustive but is intended to indicate the scope and character of the Practical course expected :

#### MECHANICS AND GENERAL PHYSICS.

Measurement of length, area and volume.

Use of Slide Callipers, Screwgauge and Spherometer.

Common Balance ; Method of oscillations Gauss's and Borda's methods.

Verification of Second law of motion Trolly or Atwood's machine. .

Verification of the parallelogram of forces.

Verification of the law of moments.

The inclined plane.

Centre of gravity of plane laminae.

Construction of different systems of pulleys.

The Simple pendulum 'g'.

Volume by displacement.

Specific gravity of Solids and liquids by Hydrostatic Balance and Specific Gravity Bottle.

Hydrometers—Common and Nicholson's.

Hare's hydrometer.

Fortin's Barometer—Standardisation. Boyle's law.

#### HEAT.

Fixed points of a mercury thermometer.

Coefficient of linear expansion of metal rods.

Coefficient of apparent expansion of a liquid (Pyknometer).

1. Coefficient of expansion of air—Constant pressure.

Constant Volume air thermometer.

Specific heat of Solids and Liquids—Method of mixture.

Latent heat of steam.

Latent heat of fusion of ice.

Melting point—Curve of cooling.

Hygrometers—Dew point : Wet and Dry.

Mechanical Equivalent of Heat (Simple form).

#### LIGHT.

Photometers—Rumford and Bunsen.

Laws of reflection—Plane mirror.

Laws of refraction—Slab.

Focal lengths of concave and convex mirrors.

Focal lengths of converging and diverging lenses.

Refraction through prisms—Minimum Deviation—Refractive index.

Total reflexion—Prisms and air-films.

Arrangement of lenses for telescope and microscope and measurement of magnifying power.

Spectrometer—Angle of prism and refractive index.

**MAGNETISM AND ELECTRICITY.**

Lines of force in a magnetic field—null points,  
 Deflection Magnetometer—Comparison of magnetic moments,  
 Vibration Magnetometer—Comparison of fields,  
 Study of Voltaic cells.  
 Ampere's Rule—Tangent Galvanometer.  
 Comparison of resistances ; Meter Bridge,  
 Resistance by Post Office Box,  
 Comparison of E. M. F's Sum and Difference Method.  
 Comparison of E. M. F's—Potentiometer.

Laws of Electrolysis—Reduction factor of a tangent galvanometer. Verification of Joule's law.

**SOUND.**

Velocity of sound in air—Resonance column.  
 Laws of transverse vibration of strings—Sonometer.  
 Frequency of tuning fork—Dropping plate.

**Books recommended for study : —**

1. A Manual of Physics by J. A. Crowther (Oxford University Press).
2. Intermediate Physics by R. A. Houstoun (Longmans).
3. Concise School Physics by R. G. Shacket (Longmans).
4. General Physics by E. Nightingale (Longmans).
5. Intermediate Physics (2 Vols.) by Venkitachari.
6. Intermediate Practical Physics by N. A. Nilakanta Iyer.
7. A Laboratory Note-book on Physics—Union Christian College, Alwaye.
8. Intermediate Physics Vol. I by J. P. Manikkam, P. E. Subramonia Iyer and Dr. S. Ramachandra Rao. (S. Viswanathan, 2/10 Post Office St. Madras.)

**Books for reference :—**

1. A Text-book of Physics by Duncan and Starling (Macmillan).
2. Everyday Physics by H. E. Hadley (Macmillan).

1945

Same as for 1944 with the following changes :—

- (i) Under text books add "A Text Book of Intermediate Physics" Vol. II by Manikkam, Subramonia Aiyar and Ramachandra Rao, (Publisher S. Viswanathan, 2/10 Post Office Street, George Town, Madras).
- (ii) Under books for Reference add "Text Book of Physics" by K. Ghosh, Publishers. The Indian Press Ltd., Allahabad.

**CHEMISTRY.**

1943 & 1944

**THEORETICAL.** Elements, compounds, mixtures : methods of separation of mixtures. Types of chemical action.

The laws of chemical combination by weight and by volume ; Equivalent weights, atomic weights, molecular weights. Avogadro's hypothesis and relation of gaseous and vapour densities to molecular weights. Symbols, empirical and molecular formulae. Chemical equations and calculations. Nomenclature. Acids, bases, salts ; oxidising and reducing agents. The classification of the elements in accordance with their general properties and the chief types of their compounds.

Methods of preparation and the chief properties of the following elements and their principal compounds :—hydrogen, oxygen, the halogens, sulphur, nitrogen, phosphorus, arsenic, carbon, silicon, and boron.

Chief sources, preparation and properties of the following metals:—sodium, potassium, (ammonium), copper, silver, magnesium, calcium, barium, zinc, cadmium, mercury, aluminium, tin, lead, antimony, bismuth, chromium, manganese, iron. The preparation and properties of their oxides, hydroxides and salts with the more common acid radicals.

**PRACTICAL.** The practical course shall be designed to train the candidate to conduct simple experiments on the subjects studied in the theoretical part.

The following scheme indicates the general scope of the practical work to be done by the students during the course.

Use of the common balance and of measuring vessels.

Separation of mixtures and study of the common processes.

Determination of solubility of solids in liquids at room temperature; of gases at room temperature and pressure.

Determination of the densities of gases and vapours.

Determination of the equivalent weights of metals.

Preparation and properties of the common gases: e. g., oxygen, hydrogen, chlorine, hydrogen sulphide, sulphur dioxide, nitrogen, ammonia, oxides of nitrogen, carbon dioxide. Methods of identifying them.

Preparation of nitric acid:

Properties of the common mineral acids and of the alkalies.

Preparation of salts by simple processes.

Identification of the common acid radicals: carbonates, sulphides, sulphites, thiosulphates, nitrites, nitrates, halides, sulphates.

Identification of the common basic radicals in combination with the above acids.

Normality. Use of standard solutions (which will be provided) in the determination by titration of the strengths of acids, alkalies, ferrous sulphate, hydrogen peroxide, oxalic acid (as a reducing agent), iodine, and alkali chlorides.

Books for study:

1. Text-book of Inorganic Chemistry by G. Senter (Methuen).
2. Do. Do. by L. Mitra (Mondal Bros., Calcutta).
3. An Intermediate Course of Practical Chemistry by K. R. K. Iyer and A. N. Poti (K. R. Swami, Trivandrum).
4. Experimental Inorganic Chemistry by Smith (Bell).
5. Inorganic Chemistry by V. Swaminatha Iyer (Ananda Book Depot 2/10 Post Office St., Madras).

Books for reference:

1. Inorganic Chemistry by Holmyard (Arnold).
2. Everyday Chemistry by Partington (Macmillan).

1945

Same as for 1944

**BIOLOGY.**

(BOTANY.)

1943 and 1944.

- (1) Living and non-living. Animals and Plants their resemblances and differences.
- (2) The external morphology of the root, stem and leaf. Inflorescence, flower fruit and seed. Pollination and fertilisation. Dispersal of fruits and seeds. Seed-formation, Homology and Analogy. Vegetative reproduction.

- (3) The cell and its structure. The origin and differentiation of cells into permanent tissues in plants with reference to the fundamental, epidermal and vascular tissues. Structure of the root, root-cap and root hairs. Structure of the stem, secondary growth in stems. Cork and Bark. Internal structure of the leaf.
- (4) Soil in relation to plant growth. Work of root, stem and leaf. Metabolism, respiration and growth. Response of plants to the stimulus of light and gravity. Storage and use of reserve food in plants.
- (5) A study of the following families of plants with special reference to their economic importance:  
 Anonaceae, Malvaceae, Rutaceae, Leguminosae, Myrtaceae, Rubiaceae, Solanaceae, Labiateae, Euphorbiaceae, Liliaceae, Palmae, and Musaceae.
- (6) The following representative types of the principal groups of plants with reference to their morphology and life-histories.  
 Spirogyra, Rhizopus, Agaricus, any one Moss and any one polystelic Fern.
- (7) An elementary knowledge on the topics given below:  
 Water plants, Sand plants and Xerophytes, Saprophytes, Parasites, Epiphytes and Insectivorous plants.

N. B. Topics in (7) above will not be included for Examination.

Candidates will not be examined in the use of the microscope but it is expected that teachers will use the microscope freely for purposes of demonstration. Students are however, expected to use dissecting microscope for the examination of floral parts.

#### BOOKS FOR REFERENCE.

A Hand Book of Botany by K. Rengachariar,  
 Botany for India by P. F. Eyson,  
 Elementary Biology by A. G. Tansley,  
 Text-Book of Botany by M. S. Sabhasen,  
 Text-Book of Botany by Lawson and Sahni.

1945

Same as for 1944.

#### (ii) ZOOLOGY AND PHYSIOLOGY.

1943 & 1944.

THE CHIEF CHARACTERS OF LIVING ORGANISMS.—Protoplasm. Cell, Plants and animals, how they agree and how they differ. Meaning of the terms Biology, Morphology and Physiology. The structure of the following animals treated in a very elementary manner with special reference to their physiology—Amoeba, Paramecium, Hydra, Obelia, Earthworm. Outline of their reproduction. A more detailed study of the external characters, and of the general arrangement and relations of the chief internal organs, as revealed by dissection in the cockroach, the frog and the rabbit. General outline of their life history. All the types mentioned above are to be studied with special reference to their environment. External Morphology of the Shark and the Pigeon.

The human skeleton and its parts. The arrangement of the chief viscera in man. The leading facts of human physiology treated in a very elementary way. The nature of food and the manner in which it is digested and absorbed. Glands. The work of the liver. The Nature and functions of the blood. The heart and the circulation. Respiration. Waste products and their removal. The temperature of the body and how it is maintained. The action of muscles. The chief functions of the central nervous system, nerves and sensory organs.

Candidates will be expected to be able to make simple diagrams to show the arrangement or general features of the chief organs and structures in the animals enumerated in the syllabus. A practical knowledge of minute structure requiring the use of the microscope will not be required.

Books for study—

Huxley (revised by Bancroft). Lessons in Elementary Physiology.

Bainbridge and Menzies : Essentials of Physiology (Longmans' Green & Co).

Parker and Bhatia : An Elementary Text-book of Zoology for Indian Students. (Macmillan).

Zoology for Medical Students by Borradaile.

Elementary Physiology by Foster and Shore (Macmillan).

Essentials of Zoology : A Meek (Longmans).

1945.

Same as for 1944 with the following change :—

Add to the list "Text book for Zoology for Intermediate and Medical Students" by C. John.

### LOGIC.

1943 and 1944.

Creighton and Smart : An Introductory Logic, omitting Chapter II and the whole of Part III.

Welton and Monahan : Intermediate Logic, revised by Mellone (for reference).

1945.

Same as for 1944.

### ANCIENT HISTORY.

#### (i) HISTORY OF GREECE.

Introduction.—Influence of geographical conditions on Greek History—The Origin of the Greeks—Aegean and Mycenaean civilisations—The Homeric poems : Political and social organisation—Dorian conquest—Spartan monarchy—Foundation of the City State ; its characteristics—Fall of Greek monarchies,—and the rise of the Republics—Rule of aristocracies : Merits and defects.

Greek Colonisation in the Mediterranean region—Nature of Greek Colonies—The Unity of the Greeks : Forces fostering it.

Growth of Sparta.—Sparta and her Constitution—The Kings—The Council—The Assembly—The Ephors—Nature of the Constitution—Internal development of Sparta—Spartan military training—The Peloponnesian League—Sparta's position in the Greek World.

Early History of Attica and growth of Athens.—Foundation of the Athenian Commonwealth—From monarchy to aristocracy—Timocracy—Economic distress—The legislation of Solon and the foundation of democracy—Growth of Athens—Tyranny of Pisistratus—Spartan intervention—Reforms of Cleisthenes.

Advance of Persia to the Aegean.—Rise of Persia—Persian conquest of Asiatic Greece.—Egypt and Thrace—Ionic Revolt—Battle of Marathon—Athens and Aegina—Ostracism—The Ten Generals—Themistocles and Athenian sea-power.

Invasion of Greece by Xerxes—Battles of Thermopylae, Artemesium and Salamis—Battles of Plataea, Mycale and Capture of Sestos.

The Western Greeks.—The Greeks and the Carthaginians in the Western Mediterranean—Tyrrants in Sicily—Carthaginian invasion of Sicily—Himera—Gelon of Syracuse.



**Foundation of the Athenian Empire.**—The confederacy of Delos—Themistocles and the fortification of Athens and the Piræus—Confederacy of Delos becomes Athenian Empire—its extent and political aspect—Cimon and the land empire of Athens—The empire at its greatest height—Peace with Persia—Athenian reverses—The Thirty Year' peace—Collapse of the Athenian land empire.

**Athens under Pericles.**—Completion of the Athenian democracy—Reforms of Ephialtes and Pericles. The Imperialism of Pericles and opposition to his policy—Draw-backs of the Democracy—Pericles as ruler of Athens—Revolt of Samos and its reduction—Growth of Athenian trade—Art and higher education—The Sophists.

**The Peloponnesian War.**—General importance of the war—Siege and capture of Platæa—Revolt and fall of Mytilene—Athenian capture of Pylos and Nisæa—Battle of Delium—The War in Boeotia and Thrace—Battle of Amphipolis—Peace of Nicias.

**New political combination with Argos.**—The Sicilian expedition of Athens—Consequences of their failure—Revolt of the Athenian Allies—The Oligarchic revolution—Fall of the Four Hundred—Restoration of Democracy—Battle of Aegospotami—Siege and surrender of Athens—Peace—Downfall of the Athenian Empire—Rule of the Thirty and the restoration of Democracy—Decay of Democracy.

**Spartan supremacy.**—Trial and death of Socrates in Athens—The Ten Thousand under Xenophon—Campaigns of Agesilaus against Persia—Peace of Antalcidas.

**Second Confederacy of Delos.**

**The Greeks in Sicily.**—Carthaginian invasion—Dionysius and Carthage—His Conquests—Dionysius II and Plato—Dion—Timoleon.

**THEBAN SUPREMACY.**—Epaminondas—battle of Leuctra—Invasions of Peloponnesus—Building of Mantinea—Battle of Mantinea and death of Epaminondas.

**RISE OF MACEDONIA. DISSOLUTION OF THE CITY STATE IN GREECE.**—Philip's aggression against the Greeks—Interference with Greek politics—Demosthenes and Philip—Battle of Chaeroneia.

**ALEXANDER THE GREAT.**—Conquest of Asia Minor, Syria, Phœnicia, Palestine, Egypt and Persia—March to India—Indian Campaigns—Aims of Alexander

**BOOKS FOR STUDY :**

History of Greece, Tutorial Series.

Greek History for Schools :—By C. D. Edmonds.

**BOOK FOR REFERENCE.**

Bury : History of Greece.

## (ii) HISTORY OF ROME.

**The Land of Italy—Peoples of Italy.**

**THE LEGENDS OF THE KINGS.**—Founding of Rome—The Kings of Rome—The Reforms of Servius Tullius—The Institutions of Regal Rome.

**FOUNDATION OF THE REPUBLIC.**—From monarchy to aristocracy—Establishment of Republic—The Institutions of the Republic—Patrician government—Struggle between the Patricians and the Plebeians—The new nobility—Roman citizenship—Rome as a democracy.

**CONQUEST AND CONSOLIDATION OF ITALY.**—The Latin League—Rome in Middle Italy—Sack of Rome by the Gauls—Annexation of South Etruria—Defeat of the Equi and the Volsci—The Samnite war—Settlement of Latium—Rome in North Etruria and Campania—War with Gauls—War with Pyrrhus—Rome mistress of Italy.

**The Roman State—Colonies—Municipia**

**The Military system.**

### ROME AND THE MEDITERRANEAN STATES :

1. Rome and Carthage—First Punic War—The Interval between the first and second Punic wars—Second Punic War—Invasion of Italy by Hannibal—Battles of the Trasimene Lake and Cannae—Battle of Zama—The West under Roman Rule—Sicily—Spain—The Third Punic war.

2. Rome and the East—Achaean and Aetolian Leagues—First and second Macedonian Wars—War with Antiochus and settlement of Western Asia—Third Macedonian war—Settlement of Greece—Roman Protectorate in Asia.

ROME DURING THE GREAT WARS. The constitution in form a democracy but in spirit an aristocracy—Army and Navy—Ascendancy of the Senate—The Roman People—The New wealth—Distinctions—Learning and manners—Hellenism.

### THE PERIOD OF THE REVOLUTION AND THE DECAY OF THE CITY STATE :

1. From the Gracchi to Sulla.—The Reforms of the Gracchi—Jugurthine war—Marius—His Military reforms—Discontent of the Italian allies and the social war—Marius and Cinna—The return of Sulla.

2. From Sulla to Caesar—Aims of Sulla—His reforms—Revival of the Senate—Rising of Spartacus—First Consulship of Pompey—Caesar, Cicero and Catiline—Coalition of Pompey, Caesar and Crassus—Caesar's command in Gaul—Pompey's consulship—Caesar crosses the Rubicon.

THE EMPIRE DURING THE REVOLUTION—Rome and the Celts :—Cisalpine Gaul—Transalpine Celts—Annexation of Southern Gaul—Caesar in Gaul, Germany and Britain—Roman advance towards the Danube—Rome and the East—The Mithradatic wars—Rome and Armenia—Annexation of Syria.

FOUNDATION OF THE EMPIRE—Caesar and the Senate—The Civil war—Caesar in Spain—Pharsalus—The Alexandrian war—Death of Cato—Second Spanish war—Dictatorship of Caesar—Caesar's rule—His reforms—His murder.

PROVISIONAL GOVERNMENT OF THE TRIUMVIRATE—Struggle for power after Caesar's death—The second Triumvirate—Division of the Empire between Octavius and Antony—Octavius in the West—War with Sextus Pompeius—Deposition of Lepidus—Octavius, master of the West—Antony and Cleopatra—Battle of Actium—Triumph of Octavius.

FOUNDATION OF THE PRINCIPATE—Restoration of the Roman Republic—The exceptional character of the Principate—The Powers of the Princes—Provisional government—Princes and the Senate—Princes and the Magistracies—Princes and the Assemblies—Death of Augustus.

#### BOOKS FOR STUDY :

Tutorial History of Rome.

Felham's History of Rome.

Warde Fowler—City State of the Greeks and the Romans.

#### BOOK FOR REFERENCE.

History of Rome by Cary.

### MODERN HISTORY.

#### GENERAL OUTLINE OF POLITICAL, CONSTITUTIONAL AND INDUSTRIAL HISTORY.

#### PART I—down to 1603.

PRE-NORMAN PERIOD—Introduction :—Coming of the English—The Heptarchy—Conversion of the English to Christianity—Rise of the English Church—The Danish Conquests and their results—Anglo-Saxon monarchy—Its weakness—Anglo-Saxon Institutions.

THE NORMAN PERIOD—Battle of Senlac—The Norman conquest of England—Political, social and economic effects—Norman feudalism—The Manorial system—William the Conqueror, William II and Henry I. Systematisation of government—The King and the Barons—The King and the Church—The anarchy of Stephen's reign.

**THE PLANTAGENET PERIOD.**—The Plantagenets—Henry II—His aims—His Judicial reforms—The reign of Law—His antifeudal measures—‘The benefit of the Clergy’—Henry’s quarrel with Becket—Results—Richard I, an absentee King—John—His blunders—The Great Charter—Its character—Submission to the Pope.

Henry III: Fight over the Charter—Early years—Favourites—Provisions of Oxford—Barons’ war—Simon de Montfort—His work.

Edward I: Emergence of the Nation—Edward’s aims—His Laws—Organisation of Parliament—Beginning of the United Kingdom—Conquest of Wales—War with Scotland and France—Edward II—Bannockburn—Influence of Parliament.

Medieval Culture: The Church in the middle ages—Monasteries—Schools and Universities—The Friars—The Town and the Guild.

Edward III: Hundred years’ War—Causes and course of the War—A new Army—Social and economic changes—Statute of Labourers—Wool and cloth—Development of Parliament in the reign—Richard II—Wycliff and the Church—The Peasants’ Revolt—Attempt at despotism and overthrow—Revolution of 1399—Literary activity.

**LANCASTRIAN PERIOD:** Henry IV—His title—Increasing strength of Parliament—Premature Constitutionalism—Rebellious—Early reforming movement—Henry V—The Lollards—Renewal of the Hundred Years’ War—Agincourt—Treaty of Troyes—Henry VI:—Minority—War with France—Joan of Arc—French victories—Marriage of Henry—Loss of France—End of the Hundred Years’ War—Wars of the Roses—End of Feudalism

Yorkist monarchy: a prelude to the Tudor despotism. Passing of the Middle Ages—Woollen trade—The Italian Renaissance—Invention of Printing—Voyages and discovery.

**THE TUDOR PERIOD:** New Monarchy—Sources of its strength—Tudor despotism:—Its character and services—Rise of the Nation—Henry VII—Establishment of order—Revolts against his rule—The King and the Nobles—Star Chamber—Commercial and Foreign Policy—Scottish marriage.

Henry VIII—War with France and Scotland—Wolsey—His foreign policy—Balance of power—England, France and the Empire.

The Reformation in Europe—Martin Luther—Henry and the Pope—Breach with Rome—Its effects—The Reformation Parliament: Importance of its work—Marriages of Henry—Acts of Succession and Supremacy—Thomas Cromwell and the dissolution of monasteries.

Henry and his Parliaments.

Edward VI—Protector Somerset—Northumberland—Calvinism—Reformation in the reign—The Prayer Book—Mary and the Catholic revival—Marriage with Philip II of Spain—Protestant martyrs—Loss of Calais.

Elizabeth—Character and greatness—Dangers at her accession—Her Church settlement—The religious parties in the country—The Reformation in Scotland—The Counter Reformation in Europe—Catholic plots against her life—Her marriage question—Elizabeth and Mary Queen of Scots—Execution of Mary—Discovery, trade and colonisation—Drake and Hawkins—War with Spain—Defeat of the Spanish Armada—Alliance with France and the Dutch—Elizabeth and the Puritans—Elizabeth and her Parliaments—Tudor Government—Social and economic conditions of the Period—Literature—The Tudors in Ireland.

## PART II 1603-1926

**THE STUART PERIOD:** The position of the monarchy in 1603—The outstanding question at issue between the Stuarts and their parliaments.

James I—His character. Puritans and Catholics—Puritan opposition—Foreign policy of James—Thirty Years’ War—Quarrel with Parliament—Overseas trade. Charles I—Character—His financial needs—Questions at issue between Charles I and his first three Parliaments—Charles and Buckingham—Petition of Right—Personal Government—Fiscal devices—Laud and Wentworth—First

**Bishop's War—The Long Parliament—Its work—Arrest of the five members—The Civil War—The King's defeat—The King in the hands of the Scots, in the hands of Parliament and in the hands of the Army—Trial and Execution—Results.**

**The Commonwealth :** A Puritan Republic—Wars in Ireland and Scotland—The Dutch wars—Trade and Colonial policy—End of the Rump—Instrument of Government—Protectorate of Cromwell—End of the Republic—Political and constitutional lessons of the Commonwealth and Protectorate.

**THE RESTORATION :** In England, Scotland and Ireland—Nature and conditions—Charles II—Character—Cavalier Parliament. The Clarendon Code—The Dutch wars—Treaty of Dover—Test act—Danby—Earl of Shaftesbury—The Popish plot—Exclusion Bills—Whigs and Tories—Triumph of Charles—Second Stuart despotism, James II—Characters—Designs—Declarations of Indulgence—Trial of the Seven Bishops—Flight of James—The Glorious Revolution of 1688.

**The Empire under the Stuarts—American Colonies—East India Company. The Stuarts and Ireland—Social and economic conditions in the period.**

**WILLIAM AND MARY :** Character of William—His plans—The revolution settlement in England, Scotland and Ireland—The Bill of Rights—Growth of Parliament—Toleration Act—Act of Settlement—Rise of Party Government—The Bank of England—National Debt—William III and Louis XIV—Spanish succession—The meance of France.—Anne—Marlborough—War of the Spanish Succession—Anne and the Tories—Dismissal of Marlborough—Union of England and Scotland—Treaty of Utrecht.

**THE EARLY HANOVERIANS :** Constitutional effects of Hanoverian succession—Rule of the Whigs—Hanoverians and Jacobites, Sir Robert Walpole—His character and methods—Control of Parliament—Cabinet Government—Breach with Spain—Jacobite rising of 1745—Colonial conflicts of England and France—Austrian Succession War—Seven Years' War—The Elder Pitt as war minister.

**GEORGE III :** His aims and character—His methods—Fall of the Whigs—Grenville, Wilkes and the Stamp Act—Lord North and the breach with the American Colonies—The war of American Independence—Intervention of France and Spain—The Nationalist movement in Ireland—Grattan—Rockingham—Shelbourne—Coalition of Fox and North—Pitt's Ministry ; His home and foreign policy.

**Change to Industrial England—The enclosures—Industrial Revolution—Coming of the machines—Steam Engine—Roads and Canals—New Towns—Laissez Faire—Factory system—The Romantic revival The Humanitarian movement—Canada—Australia.**

**FRENCH REVOLUTION :** Causes—Its influence on Britain—French war—The First Coalition—The dark years 1795-98—Napoleon in Italy and Egypt—Battle of the Nile—Second Coalition—Armed neutrality against England—Peace of Amiens—Land power versus Sea power—Attempt to invade Britain—Third Coalition—Trafalgar—Austerlitz—Jena—Tilsit—Berlin decree and the Continental system—The Peninsular war—Retreat from Moscow—Leipzig—The Hundred days—Battle of Waterloo—Congress of Vienna—Effect of the war on England—Rebellion in Ireland—The Act of Union 1800.

**THE 19TH CENTURY :** Age of Prime Ministers—Period of Reform—Economic and social evils—Castlereagh—Canning and the Eastern question—Greek Independence—Peel—Wellington and Catholic emancipation and the Irish problem.

**Reform Era—The fight over the Reform Bill—Reform Act of 1832—Its general effects—The Factory Act—Melbourne Ministry—Accession of Victoria—Palmerston's foreign policy—Chartist movement—Sir Robert Peel—Repeal of Corn laws—Russell's Ministry—Grey's colonial policy.**

**Palmerston's England :** His eastern policy—Revolution of 1848 in Europe—The Eastern question : Britain, France and Russia—Crimean war—Second

Chinese war—Unification of Italy—American Civil war—Bismark and Austro-Prussian war.

Second British Empire—A new era—1830-60—Colonial self-government—Durham Report and Canadian federation—Australia and New Zealand—The British and the Boers in South Africa—The Second Reform Act—Gladstone's first ministry—An era of Reform—Napoleon III and Franco-German war—Lord Beaconsfield—Social Reform—Imperialism—Russo-Turkish war—Congress of Berlin—Gladstone's second ministry—Third Reform Act—Irish Land Act—Partition of Africa—Gladstone and Home rule.

Victorian Age—Trade developments—Protection versus free trade—Problems of industry—Religion—Literature—Science and Art.

Queen Victoria's Jubilee—Chamberlain and Tariff Reform—Imperialism—The Far East and the Pacific—Rise of Japan—The Boer war—Death of Queen Victoria.

THE NEW AGE: Edward VII—German Empire under Bismark—Russo Japanese war—Anglo-French entente—Fall of the Conservatives—The liberal reforms—Lloyd George and the People's Budget of 1909—Home Rule Bill 1911-14—The European Crisis of 1909-13—The Balkan wars 1912-13.

The Great War: Causes—Parties—Character—Britain's part in the war—The German offensive in 1914—Poison gas—Russian disasters—Gallipoli and Salonika 1915; Verdun and the Somme 1916—The submarines and America 1917—The Russian Revolution—Jerusalem—Attack and counter attack 1918—American Intervention and collapse of Germany—The treaties Versailles, Sevres and Lausanne—Effects of the war—League of Nations.

England in 1914-22: Franchise Acts—Trade distress—Ireland 1914-22—Irish Free State—Statute of Westminster and the Dominions—Dictatorships in Europe—Italy and Germany—The U. S. S. R.

#### BOOK FOR STUDY.

Ramsay Muir: British History.

#### BOOKS FOR REFERENCE.

Trevelyan: History of England.

Carter and Mears. History of Britain, Oxford University Press, 1937.

### INDIAN HISTORY.

#### PART I—TO 1526.

PHYSICAL FEATURES: Their influence on Indian History.

PRE MAURYAN INDIA: The Indus Valley Culture—Coming of the Aryans—India in the time of the Vedas, the Brahmanas and the Upanishads—The Epics—Jainism and Buddhism.

The chief states of North India—Persian Invasion of North-west India—Rise and expansion of Magadha—Alexander's invasion.

THE MAURYS: The career of Chandragupta—Megasthenes—The Mauryan administrative system—Asoka—Character and aims—The extent of his empire—Asoka as Buddhist—Progress of Buddhism—Asoka's inscriptions—Fall of the Mauryas.

~~Pal~~ The Sungas—Kharavela—The Andhras—The Indo-Bactrians—The Sakas and  
as—The Kushans—Kanishka and Buddhism—The Satraps.  
The early Pallavas—The Tamil Kingdoms.

literature, art, religion, overseas trade,

**THE GUPTAS :** Samudragupta—Chandragupta II—Fall of the dynasty—The Gupta period—The Age of Hindu Renaissance—Fahien—The Huns—The Vakatakas—Later Guptas—Maukharis.

Harsha Vardhana—Hiuen Tsang—Break up of the Delhi empire—The Kingdoms of Hindustan—The Rajputs—Senas—Palas.

Chalukyas—Rashtrakutas—Yadavas—Hoysalas—Kadambas.

South India—Early History—The Great Pallavas—Tanjore—Cholas—The Cheras—End of Buddhism—Jainism—Sankara—Ramanuja—Art, literature and trade.

**MUSLIM INDIA :** Arabs in Sind—Invasions of Mahmud Ghazni and Muhammad Ghorī—The Sultanate of Delhi—The Slave Kings—The Khiljis—The Tughlaks

Hindu-Mussalman relations—Break-up of the Sultanate—Timur's invasion—The Sayyids and the Lodis.

The Mussalman States of Hindustan—The Bahmini Kingdom in the Dakhan—Its break-up—The five Sultanates—The Empire of Vijayanagar to Talikota.

## PART II—1526-1935.

### MUGHAL INDIA :

Babur and foundation of Mughal Empire—Humayun and Sher Shah.

Akbar—His character and aims—His conquests—His relations with the Hindus—His religious policy—His administrative system—Jahangir, Nur Jahan and Khurram—Sir Thomas Roe.

The Zenith of the Empire—Shah Jahan—His character—His campaigns—The splendour of his court—Patronage of art and letters—His buildings—War of succession.

Aurangzeb—Early career, character and aims—Mir Jumla—Religious reaction—Wars in Hindustan—Aurangzeb and Sivaji—Aurangzeb in the Dekhan—Overthrow of Bijapur and Golconda—Failure of his plans—His successors.

The Marathas—Sivaji—The Peshwas—Rise of the Sikhs—The Vijayanagar Empire 1565-1660—The Naicks of Madura and Tanjore.

### THE BRITISH PERIOD :

The Portuguese in India—Their aims, organisation and policy—The Dutch in India—The first century of the English East India Company—The Anglo-French wars in the Carnatic—The break-up of the French power.

The English in Bengal—Plassey and Buxar—Clive's Double Government.

Warren Hastings, Governor of Bengal—The Regulating Act—Hastings as Governor-General—His wars—Pitt's India Act—Lord Cornwallis and the foundation of the administrative system—The Mysore war—Cornwallis, Tippu and Travancore—The Nizam.

**THE COMPANY THE SUPREME POWER.** Marquis of Wellesley—His character and statesmanship—The subsidiary system—The French danger in India—The fall of the Mysore Sultanate—Formation of the Madras Presidency—The Maratha wars—Minto.

Marquis of Hastings—Completion of Wellesley's work—The Nepal, Pindari and Maratha wars—Lord William Bentinck—Social amelioration—Reforms—Education.

England, Russia and Afghanistan—Lord Auckland and the first Afghan war—Conquest of Sind—Career of Ranjit Singh of Lahore—His character, aims and plans—Anarchy after his death—Sikh wars and annexation of the Punjab by Dalhousie—Dalhousie's administration—Doctrine of Lapse—History of Oudh—The Great Sepoy Mutiny of 1857—Causes and results.

**INDIA UNDER THE CROWN.** Assumption of control by the Crown—Relations with Afghanistan—Lytton and the second Afghan war—The third Afghan war—Annexation of Burma.

The Crown and the Indian States—Administration of Lord Curzon—Finance—Revenue settlements—Industries and trade—Education higher and lower—Local Self Government—Social Reform—Political Reform—The Indian National Congress—The war of 1914—The Government of India Acts of 1919 and 1935.

**NOTE :** There will be a compulsory map question in all history papers.

- BOOKS FOR STUDY.** History of India—Part I—The Pre-Muselman Period by K. V. Rangaswami Aiyengar.  
Do. Part II—The Muhammadan Period by Garret and Kohli.  
Do. Part III—The British Period by Rushbrook Williams.  
History of India Rawlinson.
- BOOKS FOR REFERENCE.** History of India by R. D. Bannerjee (Blackie & Sons)
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## INDIAN MUSIC.

### THEORY OF MUSIC.

1. **FUNDAMENTAL TECHNICAL TERMS AND THEIR MEANINGS.**—Nada, Swara, Sruthi, Swarasthanas, Vadi, Samvadi, Vivadi and Anuvadi, Stayi, Graha Nyasa Amsa, Gamakas, Pitch, Intensity and Timbre.
2. **RAGAS AND RAGA LAKSHANAS IN GENERAL.** Definition and classification of Ragas and the principles thereof—Mela, Janya, Upanga, Bhashanga, Sampoorana, Shadava, Audava—Ghana—Naya-Deseeya. The 72 Melakarthis.
3. **THALA SYSTEM OF SOUTH INDIA :**—Laya—Thala—Seven thalas—35 thalas—Chapu thalas—Anga—Aksharakala Matra, Graha, Gathi, Jathi—Sama—Atila Anagatha Shadangam—Shodasangam.
4. **MUSICAL FORMS :**—The characteristics of the following types :—Githa, Swarajathi, Varnam, Kirthana, Javali, Pada, Chindu, Ragamalika.
5. **PRINCIPLES OF CARNATIC NOTATION :**—(Sa—ri—ga—ma)
6. **History of South Indian Music and biographies of the following musicians and composers and their contributions to Carnatic music**—Venkitamakhi-kshetrangana, Muthuswami Dikshidar, Thiagaraja, Syama, Sasthri, Pattanam Subramonia Iyar, Swathi Thirunal Maharaja of Travancore, Arunachala Kavirayar, Gopalakrishna Bharathi and Ramnad Srinivasa Iyengar.
7. **FOLK MUSIC AND THEIR CLASSIFICATION :**
8. **A KNOWLEDGE OF THE FOLLOWING 20 RAGAS** and of at least one musical composition in each :—Thodi, Bhairavi, Kalyani, Sankarabharanam, Kamboji, Saveri, Mohanam, Mukhari, Kedaragonla, Dhanyasi, Madhyamavathi, Arabhi Balahari, Yadukulakamboji, Baegada, Anandbhairavi, Nadanamakriya, Nattakurumji, Sahana, Kamavardhini.

There shall be a practical examination in either vocal or instrumental music and a separate minimum of 35 per cent. will be required in the practical examination. As regards the instruments, candidates will have the choice of playing on either Veena or Violin. In the practical examination, candidates will be expected to sing or play 5 Githas, 3 Varnas—one padam, one Javali and Kirthanas in the 20 Ragas prescribed as well as compositions in Adi, Rupaka, Triputa and Chapu thalas.

Candidates will be expected to elaborate (i. e. alapana) the first ten Ragas prescribed. Candidates should know at least 3 compositions of Swathi Thirunal Maharaja of Travancore,

## BOOKS FOR REFERENCE.

1. Sangitha Sampradaya Pradarsini, by Subbarama Dikshidar—Two volumes and the Primer.
2. Oriental Music in European Notation—by A. M. Chinnaswami Mudaliyar.
3. Music of India by Rev. H. A. Popley.
4. Music of Hindustan by A. H. Fox—Strangways.
5. Richardson—"Sound."
6. T. S. Krishnaswami "Sound."
7. Modern Violin Technique by Thisleton.
8. "Thyagaraja" by M. S. Ramaswami Aiyar.
9. Singaracharlu's Musical Publications in seven parts.
10. "Thyagaraja Hrudayam"—3 volumes by K. V. Srinivasa Aiyangar.
11. Bharata Sangita Swayambhodhini by T. C. R. Johannes.
12. "Sound" by Nightingale (Bell & Sons.)
13. The Melakarta Janyaraga by P. Sambamurti, (The Indian Music Publishing House, G. T. Madras).
14. Swaramanjari by T. Singaracharlu.
15. Gayaka Parijatham by "
16. Sangita Kalanidhi by "
17. Gayaka Sidhanjanam Parts I & II "
18. Sangita Chintamani by K. V. Srinivasa Aiyangar.
19. Sangita Sudhambudi by "
20. Swaramalakalanidhi—edited by M. S. Ramaswami Aiyar.
21. Harmonia Bodhana Sangita Ratnam—edited by Subramanya Aiyar.
22. Varnamalika by K. Ramachandran.
23. Kirtana Sagaram, Book I by Mr. P. Sambamurthi. (The Indian Music Publishing House, G. T. Madras).
24. Gnanabhaskara by K. V. Srinivasa Aiyangar.
25. Syamasastri and other Composers by Sambamurthi.
26. 'Raga Panjaram' by R. Madhava Warrior (Kilimanoor).
27. 'Sangita Vidvarangam' by S. Renga Iyer.
28. Sangita Raja Rengam Do.
22. 'Swathi Thirunal's Compositions' published by Chidambara Vadyar.
30. 'Balamritham' by S. Renga Iyer.
31. Karunamritha Sagaram by Abraham Pandithar.

## TEXT-BOOKS.

## Intermediate Examination—1942.

## PART I—ENGLISH.

## SHAKESPEARE:—

Twelfth Night.

## POETRY:—

Selections in English Poetry (The University of Madras Intermediate Examination):

The following poems;

Wordsworth: Laodamia;

Lord Tennyson: Morte D'Arthur;

Walter De La Mare. The Sleeper; Miss Loo;

Farewell; Arabia; The Scribe;

Sackville West: Mirage.

## PROSE:—

(1) Carlyle's Abbot Samson, Edited by F. A. Cavenagh (Macmillan &amp; Co.)

(2) This Modern World, Selected and edited by L. Brander (Oxford University Press).



- NON-DETAILED STUDY**
- (1) Jim Davis by John Masefield (The Heritage of Literature Series; Longmans).
  - (2) Quest and Conquest—An Anthology of Adventures, compiled by E. V. Odle (The Scholar's Library: Macmillan & Co.)

**PART II—MALAYALAM.**

- NON-DETAILED STUDY :**
- (1) Durgesa Nandini by C. S. Subramonian Potti, M. A., (എടുത്തുനടി) (B. V. Book Depot, Trivandrum).
  - (2) Bhuvana Deepika (ഭൂവനദീപിക) by Muthukulam Parvathi Amma, Vidwan, (Devikumar & Co., Trivandrum).

- DETAILED STUDY—POETRY**
- (1) Ramayanam Aranyakandam (രാമായണം ആരണ്യകാണ്ഡം) by Thunchat Ezhuthachan—(Any press.)
  - (2) Ghoshayathra Thullal (ഘോഷയാത്ര തുള്ളൽ) by Kunchan Nambiyar—(Any press.)
  - (3) Pancharathram Natakam (പഞ്ചരാത്രം നാടകം) by Vallathole Narayana Menon.
  - (4) Manimanjoosha (മണിമഞ്ജുഷ) Sections 1, 3, 4, 5, 8, 9, 12, 13, 14 and 15 by Mahakavi Rao Sahib Sahithyabhooshana Ullur S. Parameswara Aiyar, M. A., B. L.
  - (5) Nalini (നളിനി) by N. Kumaran Asan.
  - (6) Sri Yesu Vijayan Kavyam, Cantos 1 and 2 (ശ്രീ യേശുവിജയനകാവ്യം) by Kattakkayathil Cheriyan Mappillai.

- PROSE**
- (1) Randu Sahithya Nayakanmar (രണ്ടു സാഹിത്യനായകന്മാർ) by A. D. Hari Sarma.
  - (2) Sahithya Sarani (സാഹിത്യസരണി) by D. Padmanabhan Unni, M. A.

**PART II—TAMIL.**

- POETRY.—** Selections in Tamil Poetry for the Intermediate Examination of 1942 published by the University Madras.

- DRAMA—** Viswanatham by C. S. Muthuswamy Aiyar—published by M. R. Appadurai, B. A., 57 Anderson Street, of Madras.

- Prose—Detailed Study.**
- (1) Karanthai Katturai Kovai—published by Karantai Tamil Sanghom, Tanjore.
  - (2) Ancient famous Tamil Poets Part I by A. Kar-mekhakone.

- Non-detailed Study.**
- (1) Meenakshi Sundaram Pillai Charitram—Part II by Dr. V. Swaminatha Aiyar, Tyagaraja Vilas, Triplicane
  - (2) Annapurnalayam by T. Ramalingom Pillai, M. A.,—published by R. S. Pillai, Gandhari Amman Street, Trivandrum.

**PART II—SANSKRIT.**

Svapnavasavadatta.

Kalidasa's Raghuvamsa, Cantos 12 and 13.

Dandin's Dasakumara Carita.

Uchavasas I—III of Purvapithika.

## PART II—HINDI.

Gadyaratnavali—Published by Indian Press Ltd. Allahabad omitting essays Nos. 2, 5, 8, 9, 11, 13, 16, 18 and 19. (Edition of 1938).  
Detailed Poetry :—

1. Chune hue phul—D. B. H. P. Sabha (1938) omitting Dusara Guchha.
2. Rang me bhang—Maithilisan Gupta (Sahitya Sadan).

Non-Detailed :—

1. Hindi kahaniyan (Hindi Bhavan, Lahore).
2. Sinha garh Vijaya (Abhodaya Prem, Allahabad).

## PART II—ARABIC.

Name of Text-book.	Author or Editor.	Publisher.
Prose—Qirathur Rasheeda, Part IV. (Poetry portions omitted).	Abdul Fathah Sabri Beg and Ali Umar Beg.	Macmillan and Co., Ltd., Madras.
Poetry—Dewaanu Abil Ithahiya.	Abdul Ithahiya.	University Book Depot, Aligarh.
Grammar—Thatcher's Arabic Grammar, OR Qawaidul Lughathul Arabia, Part III.	Thatcher.  Ibrahim Mustafa and others.	Do.  Arabic Library Co., Book Sellers and Publishers, Orient Hotel Building Cr. Market, Bombay 3.

## PART II—FRENCH.

- (a) Grammar :—Berthenshaw's French Grammar (Longmans).  
(b) Texts :—Le Desert de Glace by Jules Verne edited by Grace Lloyd (Nelson).

Les Oberle by Bazin edited by I. H. Spiers (D. C. Heath & Co.)  
Mon Oncle et mon cure by Jean de la Brete edited by Goldberg (Macm).  
French Short Stories collected by T. B. Rudmose—Brown (Nelson) omitting "L'Etoile de bois" by Marcel Schowb.

## PART II—SYRIAC.

Prose :—

1. Gospel of St. Mathew, Chapters XVI to XXVIII (both inclusive), St. Joseph's Press, Mannanam.
2. History of Susanna Daniel, XIII.

Poetry :—

Theshbohtha Dbeth Hannania.  
Syro-Malabar Breviary.  
(St. Joseph's Press, Mannanam, 1913 edition, pp. 412-415.)

Grammar :—

1. Syriac Grammar, Gabriel, St. Joseph's Press, Mannanam.
2. Paradigms and Exercises in Syriac—T. H. Robinson.

## Intermediate Examination—1943.

## PART I—ENGLISH.

Shakespeare :—Julius Caesar.

Poetry : Morte D' Arthur ; Laodamia ; Walter De La Mare's The Sleeper ; Miss Loo ; Farewell ; Arabia The Scribe ; Sackville West's Mirage—in the Selections in Poetry published by the Madras University.

Prose : This Modern World (Oxford).

Macaulay's Life of Bunyan and Life of Goldsmith\*

Non-detailed Texts : Kipling's Selected Stories, omitting the poems (Macmillan).  
Master Minds of Science (Harrap)—Harrap's Modern Readers.

## PART II—MALAYALAM.

Detailed study 1. Sundarakandam by Thunchat Ezuttachau—Any Press.

Poetry : 2. Syamanthakam Thullal by Kunchan Nambiar—Any Press.

3. Abhisheka Natakam by Vallathole Narayana Menon,—Kamalalaya Book Depot, Trivandrum.

4. Hridaya Kaumudi by Mahakavi S. Parameswara Iyer (Selections 2, 4, 5, 6, 7, 8, 9, 11, 12 and 13)—B. V. Book Depot, Trivandrum.

Detailed Prose. 1. Kesari by Vengail Kunjuraman Nayanar.

2. "Chandu Menon" by Murkoth Kumaran, Vidyavilasom Publishing House, Trivandrum.

Non-detailed 1. Snehalata by Kannan Menon, B. V. Book Depot, Trivandrum.  
Prose.

2. Seeta Nirvasam, by R. Narayana Panikkar, Reddiyar Press, Trivandrum.

## PART II—TAMIL.

Poetry. (Selections published by the University of Madras)

	Lines.
Palamoli	100
Tamil Vidu Tutu	100
Peruntogai	40
Naidadam (Kanpugu Padalam)	84
Cilappadigaram (Kolaikkalakkadai)	217
Bhagavatam (Aravinmeladiya Attiyayam)	180
Rakshanya Yattirikam (Atma Vedanai)	120
Purananuru	100
Narrinai	60
Kambaramayanam (Ravana Vadaippadalam from 198th Stanza to the end)	224
Paranjoti Tiruvilaiyadal (Manoumunda Padalam)	300
Tiruccendur Murugan Pillaittamil	40

Drama. Ravi Varma by T. Lekshmana Pillai, B. A., Trivandrum, Publisher Mrs. L. Narayanan Nair, M. A. Lecturer College for Women, Trivandrum.

\* Written by Macaulay for the Encyclo-paedia Britannica.

- Prose-Detailed Study.** 1. Arputha Ulakom by P. N. Appusawami Iyer, B. A., B. L., Madras.  
2. Caldwell Iyer Charitram by R. P. Sethu Pillai, B. A., B. L., Madras.
- Non-detailed Study :** 1. Ninaivoo Manjeri by Dr. Swaminatha Iyer, Madras.  
2. Prathapa Mudaliar Charitram by Vedanayakom Pillai, Retired District Munsiff, Mayavaram.

## PART II—SANSKRIT.

- Bhāṣa:** Svapnavasavadatta.  
**Kalidasa:** Raghuvamsa, Cantos 12 and 13.  
**V. K. Thampy :** 'Three Plays in Sanskrit.'

## PART II—FRENCH.

- Grammar :** Brethenshaw's.  
**Text-books :** 1. Le desert de glace by Jules Verne edited by Grace Lloyd (Nelson).  
2. Short French Stories edited by T. B. Rudmose Brown (Nelson) omitting "L'Etoile de bois" by Marcel Schowb.  
3. La Batailles des Falkland by Claude Farrere and Chack, edited by W. G. Hartog (O. U. P.)  
4. A new book of French Verse by N. Cooper (O. U. P.)

## PART II—HINDI.

- Detailed Prose.** Hindi Madhuri Volume I published by D. B. Hindi Prachar Sabha, Madras.
- Detailed Poetry.** 1. Chune hue phul—D. B. Hindi Prachar Sabha, (1938) omitting Dusara Guchha.  
2. Rang me bhang—Maithilisaram Gupt (Sahitya Sadan).
- Non-detailed.** 1. Hindi Kahaniyan (Hindi Bhavan, Lahore).  
2. Simha Garh Vijaya (Abhudaya Press, Allahabad).

## PART II—ARABIC.

- Prose.** Ajaibul Mazi—Ahamed Athiyathullah,—Arabic Library & Co., Book Sellers and Publishers, Orient Hotel Building, Bombay.
- Poetry.** Diwanu Abul Atahiya. Kafiyaatul Yayi (Part II) Abul Atahiya University Book Depot, Aligarh.
- Grammar.** Thatcher's Arabic Grammar, Rev. G. W. Thatcher, M. A. A. D., Macmillan & Co., Madras.

## PART II—SYRIAC.

Same as for 1942.

## PART II—LATIN.

- i. Cicero : The Orations of Cicero against Catilina by A. S. Wilkins, Litt. D., LL. D. (First Oration Only).  
ii. Livy : Book V by Leonard Whibley M. A. (Pitt Press Series).  
iii. Virgil : Book IX by T. E. Page, M. A. Litt. D. (Elementary Classics).

## GRAMMAR.

Books recommended for study :—

A complete Latin Grammar by Jean, S. J., St. Joseph's College Press, Trichinopoly.

OR

A complete Latin Grammar by Rev. Pettimangin adapted into English by Rev. Fr. M. Soyres, Catholic Mission Press, Pondicherry.

## Intermediate Examination—1944.

## PART I—ENGLISH.

- Shakespeare : Julius Caesar.
- Poetry : Gray's Elegy ; Ancient Mariner ; Ode to Napoleon ; The Inscription ; The Great Lover (Twenty Great Poems : Collins—Edited by H. A. Treble).
- Prose : English Prose Selections by Dickinson and Sharma (Macmillan); Macaulay's Life of Bunyan and Life of Goldsmith.
- Non-detailed Texts. 1. Dickens' David Copperfield (Herbert Strang's Library, Oxford);
2. Real Achievement (Longmans).

## PART II—MALAYALAM.

Detailed Study—1. Ayodhyakandam by Thunchat Ezhuttachan—Any Press.

Poetry.

2. Santhanagopalam Thullal by Vidwan Koil Thampuram.
3. Swapnavasavadattam Natakam by 'A. R. Rajaraja Varma, Kamalalaya Book Depot, Trivandrum.
4. Sahithyamanjari Part IV by Vallathole Narayana Menon.

Detailed Prose: 1. Prabandhakalpalata by P. K. Narayana Pillai, Sri Rama Vilasam Press, Quilon.

2. "Kodangalloor Kunjukutten Thampuram" by Koilpilli Parameswara Kurup, Vidyavilasam Publishing House, Trivandrum.

Non-detailed Prose. 1. Kollimeen by D. Padmanabhan Unni, Alwaye.

2. Kstraprabhavam by Ambadi Narayani Puduvalsyar.

## PART II—TAMIL.

Poetry : (Selections published by the University of Madras).

	Lines.
Purananuru	100
Narrinai	60
Kambaramayanam (Ravanavadaippadalam)	224
Paranjoti Tiruvilaiyadal (Mansumanda Padalam)	300
Tiruccendur Pillai Tamil	40
Naladiyar	100
Manimekhalai—Malarvanam pukka katai	170
Villibharatām—Soothuporecarukkam	200
Kandapurānam—Valliammai Tirumanappadalam	200
Kumaraguruparar's Meenakshiammal Kuram	100
Tirukkaruvai Padittruppattandati	80
Drama: Satyavati Natakam by T. Lakshmanan Pillai, B. A., Trivandrum.	

**Prose:****Detailed Study:**

Silappathikaram Vilakkam by R. T. Sethu Pillai, B. A., B. L., Madras.

**Non-Detailed Study:**

1. Mayavinuthini (Translation of Dr. Rabindranath Tagore's novel) Kalaimakal Office, Mylapore, Madras.
2. Thiruvalluvar by T. Chelvakesavaraya Mudaliar, M. A.

**PART II—SANSKRIT.**

Same as for 1913.

**PART II—FRENCH.**

Same as for 1913.

**Grammar:****Text-Book.**

1. La Batailles des Falkland.
2. A new book of French verse by N. Cooper (O. U. P)
3. Les lettres de mon moulin by Daudet (Nelson) omitting Les Oranges, A Milianah and En Camargue.
4. La Chute from Victor Hugo's "Les Misérables" edited by H. C. O. Huss (D. C. Heath & Co.)

**PART II—SYRIAC.****Prose :**

1. Gospel of St. Mathew, Chapters VIII to XVI, (both included).
2. The History of Cain and Abel : Genesis IV.

**Poetry :**

A poem of James of Sarug, Kunosh Margonyotho Suryo-  
yotho.

**Grammar :**

1. Syriac Grammar, Gabriel, St. Joseph's Press, Man-  
nanam.
2. Paradigms and Exercises in Syriac—T. H. Robinson.

**PART II—HINDI.****Detailed Study.****Poetry :**

1. Chune Hue Phul (omitting Dusara Guecha) - Pub-  
lished by the D. B. Hindi Prachar Sabha, Madras.
2. Rang me Bhang - Maithilisanan Gupta.

**Prose :**

Hindi Madhuri - Part II (omitting lessons 2 and 15)—  
Published by the D. B. Hindi Prachar Sabha,  
Madras.

**Non-Detailed Study:**

1. Maharashtra Jeevan Prabhat by Rames Chandra  
Dutta.
2. Naw Kahaniyan—D. B. Hindi Prachar Sabha,  
Madras.

(All the above books are available at the Hindi Prachar Pastak Maudir,  
Thyagarayanagar, Madras).

**PART II—ARABIC.**

Same as for 1913.

**PART II—LATIN.**

Same as for 1913.

**INTERMEDIATE EXAMINATION—1915.****PART I—ENGLISH.****Shakespeare :**

The Merchant of Venice.

**Poetry :**

Gray's Elegy ; The Ancient Mariner ; Ode to Napoleon ;  
The Inscription ; The Great Lover, (Twenty Great  
Poems) edited by H. A. Treble (Collins).

- Prose :** English Prose Selections by Dickinson and Sharma (Macmillan). Boswell's Life of Johnson (Bell's English Texts) edited by Marsh (G. Bell and Sons).
- Non-detailed Texts :** Scott's The Talisman. (Herbert Strang Library) (Miford, Oxford University Press). Julius Caesar by John Buchan (Short Biographies Series—Nelson and Sons.)

## PART II—MALAYALAM

**Detailed Study:—  
Poetry :**

1. Kiiskindhakandam of Adhyatmaramayanam Kili-pattu—Any Press.
2. Tripuradahanam Tullal by Kunchan Nambyar—Any Press.
3. Malavikagnimitram (Translation) by A. R. Rajaraja Varma. (B. V. Book Depot, Trivandrum).
4. Raktakanii athava Marditanaya Maharshi by Rev. Father Joseph Neduneira (Catholic Mission Press, Kottayam).

**Prose :**

1. Gadyapushpanjili—Part I by Kerala Varma Amma-man Tampuran.
2. V. C. Balakrishna Panikkar by Kannan Janardanan (V. V. Publishing House).

**Non-Detailed Study:**

1. Karmabhalam by B. Kalyani Amma, B. A., L. T., (Norman Press, Calicut).
2. Ksatraprabhavam by Ambadi Narayani Puduvalaya (Mangalodayam Press, Trichur).

## PART II—TAMIL.

**Selections in Tamil Poetry :—**(Published by the University of Madras.)

	Lines.
Naladiyar	100
Manimekala' ai- Malarvananupukka Katai	170
Villi Bharatam—Soothuporecarukkam	200
Kandapuranam—Valliammai Thirumana-padalam	200
Kumaraguruparar's Minakshiammai Kuram	100
Tirukkavai Padirrupattaudati	80
Purananuru from 1 to 100 verses (not prescribed for 1944)	100
Kalladam	60
Kambaramayanam—Sundarakandam—Katchipadalam	240
Tirukkuralappuranam	240
Muttukumaraswamippillaittamil	40

**Prose :****Detailed Study :**

1. Urai Nadai Kovai Part II by Pandithamony M. Kathiresa Chettiar, Mahipalan Patti, Ramnad District.
  2. Nobe' Parisu Patta Aruvai published by M. R. Appadurai, B. A., 57 Anderson Street, Madras.
- Non-detailed Study :**
1. Chilambu Selvam published by Anbu Nilayam, Ramachandrapuram, Trichinopoly District.
  2. Cholar Koyil Panikal by J. M. Somasundaram Pillai, B. A., B. L., Executive Officer, Sri Dandayuthapani Devasthanam, Palni.

## PART II—SANSKRIT.

**Bhāṣa :****Kalidasa :****V. K. Thampy :****Pratimanataka.**

Reghuvamsa, Cantos 12 and 13.

—“Three Plays in Sanskrit”.

## PART II - FRENCH.

1. Les lettres de mon Moulin.
2. La chute from Victor Huges, 'Les Miserables' edited by H. C. O. Huss, (D. C. Heath & Co.)
3. Tartarin de Tarascon by A. Daudet edited by C. F. Mackenzie, M. A. (Nelson's 'Modern Studies Series').
4. A book of French Verse from Hugo to Larbaud by T. B. Pudmose Brown (O. U. P.) from poem No. 1 to 40 inclusive).

## PART II - HINDI.

Will be published later.

## PART II - ARABIC.

Will be published later.

## PART II - SYRIAC.

Will be published later.

## PART II - LATIN.

Same as for 1944.

## B. A. DEGREE EXAMINATION,

## SYLLABUSES.

## PHILOSOPHY.

1948 & 1944.

## GROUP I (a).

Psychology.	R. S. Woodworth: Psychology (10th edition).
Ethics.	J. S. Mackenzie: Manual of Ethics, Books I, II and III - Chapters 2, 6 and 7 (including Introduction). Creighton and Smart: An Introductory Logic (Part III). Bosanquet: Essentials of Logic (first four lectures).
European Logic.	G. H. Sabine: A History of Political Theory (1937 edition) Chapters 1 - 8 and 26 - 34.
Political Philosophy.	A. R. Lord: Principles of Politics. (For references) Tarkasaugraha of Annam Bhatta (sections 28-42 beginning with "buddhi" and ending with "smriti").
Indian Logic.	
Indian Philosophical	
Classical.	Sankhya Karikas (edited by S. S. Sastri).
European Philosophical	
Classical.	1943 Kant: Metaphysic of Ethics. 1944 Leibniz: Monadology.

## GROUP (i - b).

Syllabuses and papers under Psychology, Ethics and Political Philosophy are the same as for Group i-a.

Syllabuses and Papers for the other subjects will be the same as for the History and Economics Group.

1945.

## GROUP (i-a)-PHILOSOPHY.

Psychology.	R. S. Woodworth: Psychology-12th edition if available; if not available, 11th edition.
Ethics.	J. S. Mackenzie-Manual of Ethics Books 1, 2 and 3-Chapters 2, 6 and 7 (including introduction).
European Logic.	Creighton and Smart-An Introductory Logic 'Part III. Bosanquet-Essentials of Logic 'first four lectures'.



Political Philosophy.	G. H. Sabine—A History of Political Theory '1937 edition' Chapters 1—8 and 26—34.
	Reference : A. R. Lord—Principles of Politics.
Indian Philosophical Classic.	Vedantasara of Sadananda.
Indian Logic.	Annam Bhatta—Tarkasangraha 'sections 28—42 beginning with "Budhi" and ending with "Smriti"'. -----
European Philosophical Classic.	Descartes : Meditations.

#### GROUP (i-b)—PHILOSOPHY.

Syllabuses and papers under Psychology, Ethics and Political Philosophy are the same as for Group i-a.

Syllabuses and papers for the other subjects will be the same as for the History and Economics Group.

## HISTORY AND ECONOMICS.

### Groups (ii-a & b.)

#### POLITICAL SCIENCE.

##### PART I—THEORY.

1. (a) Scope of politics as a science. Its relations to History, Economics, Ethics and Sociology.

The State. Its characteristics—Its relations to other political terms such as nation, society, government.

(b) The origin of the State : Deductive theories—the theory of Divine Right, the theory of social contract, the theory of instinct, the theory of force and the organic theory. Their real value—Inductive theories : The patriarchal and the matriarchal—The family, patriarchal and matriarchal—Characteristics of patriarchal society—Patriarchal institutions.

(c) Evolution of primitive headship—Expansion of society by slavery, adoption, conquest and amalgamation—Illustrations—The place of war and custom in the growth of the early State.

2. The theory of the separation of powers—The contribution of Montesquieu—Statement and criticism of the theory.

3. The Sphere of the State. The theory of Laissez Faire—Its decline—Modern socialism, collectivism versus communism.

Theory of Sovereignty. History of the theory—Contemporary attitude to sovereignty—Relations of sovereignty, Law, Right and Liberty. Sovereignty and International Law.

##### PART II—COMPARATIVE POLITICS.

4. (a) Tribal Polity : Comparative study of the ancient Politics of the Greeks, the Romans, the Germans and the Aryans in the Punjab.

(b) The City State : Its political organisation—General course of political evolution : monarchy, aristocracy, oligarchy, tyranny, democracy—The Spartan and the Athenian constitutions as types of oligarchies and democracies—Historical development of the Athenian constitution—perfection of democracy—Contrast between ancient and modern democracies—Greek Federal Governments.

Rome—The early republican constitution and the struggle between the Orders : its peculiarities. Arrest of democracy. Constitution of Rome in the second century B. C.—The transition to the Principate, Government of Augustus : Dyarchy—The later Roman Imperial constitution—Provincial administration—Comparison of the Roman and the British Empires.

Decay of the City State—Causes.

(c) Feudalism : Its rise and decay, its contribution to development of polity, abortive attempts at constitutional government by representative institutions : illustrations—causes for their success in certain countries like England and for their failure in certain countries like France—Medieval City States : comparison and contrast with the Ancient City States.

(d) Rise of the Country State : Geographical discoveries, maritime expansion, rise of the middle class—political effects of the Renaissance and the Reformation—Rise of absolute monarchies : reaction against them in England and France—influence of the French Revolution.

Progress towards constitutional monarchy in England—Constitution-making in other countries in the 19th century—influence of England and France.

Federations as forms of political organisation.

The British Commonwealth of Nations. Statute of Westminster.

(e) The Legislature : Bicameral organisation—the composition of the two chambers and the distribution of powers—solution of deadlocks—Instructed versus uninstructed representation. Minority representation.

(f) The Executive. The Parliamentary and the Presidential types—the efficiency of the respective types—advantages and disadvantages.

(g) The Judiciary—General organisation in the different countries.

The 'Rule of Law' and 'Droit Administratif'.

Position of the Supreme Court of the United States.

(h) Local Government : Its organisation and functions.

(i) Parties : Their relation to democratic Government—how organised—the two-party system and group organisation ; effects on Parliamentary Government.

Place of the permanent Civil Service in modern constitutions.

(j) Constitution : Rigid and flexible ; written and unwritten ; chief contents ; constitutional amendment.

Political conventions, their use and value.

(k) The Constitutions of England, France, Switzerland, Germany, United States of America, India and the self-governing Dominions and Italy.

V. The League of Nations—its organisation and importance.

Text Books.

1. Leacock : Elements of Political Science.
2. Sidgwick : Development of European Polity.
3. Strong : Modern Political Constitutions.

Books for reference :

1. Dicey : Law of the Constitution, edited by Wade (1935) ; Jennings : The Law and the Constitution, second edition (1938) ;
3. Garner : Introduction to Politics ; and
4. Palande : Indian Administration (1939)

## INDIAN HISTORY

1942.

(There will be a compulsory map question in this paper)

### Part I -to 1526

INFLUENCE OF GEOGRAPHICAL FEATURES ON INDIAN HISTORY.

SOURCES OF INDIAN HISTORY.

PRE-HISTORIC INDIA : Earliest Inhabitants—Palaeolithic and neolithic man. The metal age—Indus Valley Culture—its relation to Vedic and Dravidian cultures. Dravidian India.

**VEDIC PERIOD.** The Indo-Aryan tribes. The Vedas—Social and political condition of the Aryans in the Vedic period—The epics—Social conditions in the epic Period—The Puranas—Caste system—Aryanisation of India.

**RISE OF MAGADHA :** Relations with Kosala, Avanti and Panchala—Republican States—Social and economic condition of North-east India before Buddha—Religious ferment in the 6th century—Mahavira and Buddha—Persian conquest of North-west India—Literature, economic and social life—Alexander's Invasion—The extent of Persian and Greek influence on India.

**THE MAURYAN EMPIRE.** Authorities for the period—Mauryan chronology—Chandragupta's empire—Mauryan organisation—Megasthenes—Kautilya.

Asoka—Character and aims—date of accession—contemporary powers—Asoka and Buddhism—His inscriptions—Literature and Art—Fall of the dynasty.

The Sungas—Brahminical reaction—The Kanvas—the Andhras—Kharavela.

The Indo-Greek dynasties of North-western India—The Sakas and Pahlavas—Indo Bactrians—Menander—The Kushan Kings—Kanishka—His date—Kanishka as a Buddhist—Mahayana Buddhism—Literature and art—Expansion of trade and commerce—The Satraps.

The Tamil States—Tamil Sangam Literature—Social and political conditions—Tamil Kings—Jainism—Buddhism—Internal and foreign trade—Colonisation of Malaya and Indo-Chinese Peninsula.

The Guptas—The period of golden age—Literature, art and science—Hindu Renaissance—Samudra Gupta—Chandragupta II—Fa-hien—The Huns—Yasodharman.

The Vakatakas—the Maukharis—the Early Pallavas.

King Harsha—Hiuen-Tsang.

**MEDIAEVAL HINDU KINGDOMS OF NORTH INDIA :** Nepal—Kashmir—Assam—The Rajputs—Gurjara-Pratihara—Chandels—Palas—Senas.

Rise and expansion of Islam—Arabs in Sind—Turki raids—Sultan Mahmud of Ghazni.

Deccan : Western Chalukyas—Rashtrakutas—Eastern Chalukyas—Kakatiyas—Hoysalas—Yadavas—Literature, culture, religion and art.

**SOUTH INDIA :** The Pallavas—Their origin—Extent of their empire—Their contribution to Indian Culture—Pallavas and Pandyas—Imperial Cholas—Parantaka—Raja Raja the Great—Rajendra Chola I—Later Cholas—Chola Administration—Extent of Chola Empire—Chola art and religion—The Pandyas—Marco-polo—The Chera Kingdom—Foreign notices of the West Coast—Christians in Malabar—Greater India.

**SULTANATE OF DELHI :** Sources for the period—Muhammad Ghori and Prithvi Raj—Kutbuddin—Foundation of the Sultanate—The Slave Kings—Muslim conquest of Hindustan—Causes of Muslim success. Iltutmish—Chingiz Khan—Balban—The Khiljis—Muslim conquest of the Deccan—Alauddin—His policy—The Tughlaks : Muhammad-Bin Tughlak—His Character and measures—Ibn Batuta—Mongol invasions, Break up of the Sultanate—Rise of Vijayanagar and Bahmini Kingdoms—Firoz Shah—Timur's invasion—The Sayyids—The Lodis—Delhi and Jaunpur—The Problems of the Sultanate—Its administrative system—Religious and social events—Language and Literature—art and architecture.

Disruption of the Sultanate—Muslim Kingdoms of Hindustan. The Bahmini Kingdom in the Deccan, Its extent—The Sultans—Muhammad Gawan—End of the dynasty—Its character—The social and economic conditions in the period—The five Sultanates—Their history.

Vijayanagar—Its origin—its special interest—Its foreign relations—Its dynasties—Krishnadeva Raya—Battle of Talikota—Administration—Army—Literature—Art—Religion.

## BOOKS RECOMMENDED FOR STUDY

- V. A. Smith : Early History of India.  
 Do. Oxford History of India.  
 Do. History of Fine Arts in India and Ceylon.  
 Cambridge Shorter History of India.  
 Moreland and Chatterjee : A short History of India.  
 P. T. Srinivasa Aiyangar : History of the Tamils.  
 Rhys Davids : Buddhist India.  
 Brown : Indian Coins.

OR

## PART II. 1526-1936.

**MUGHAL INDIA :** Sources of history—the Mughals—North India on the eve of the Mughal Conquest—The character of the Mughals—Babar—Humayun—Sher Shah—Return of Humayun—Akbar—Character and aims—His place in Indian History—His conquests and organisation of Empire—Religious opinions—Relations with Hindus and Christians—administrative system—Social, economic and religious conditions—Jahangir, Nurjahan and Prince Khurram—Sir Thomas Roe—Shah Jahan—Character—His administration—His Vazirs—Foreign Campaigns—The Splendour of his court—Patronage of art and letters—Public buildings—Shah Jahan and Aurangzeb—War of succession—Aurangzeb—Early Career and character—Aurangzeb and Mir Jumla—Religious reaction—Wars in Hindustan—Aurangzeb and Sivaji—The Afghan and Rajput wars—Aurangzeb in the Deccan—Overthrow of Bijapur and Golkonda—The Marathas after Sivaji—Aurangzeb's failure against the Marathas—Aurangzeb's responsibility for the break-up of the Mughal empire—Other causes for the break-up—Successors of Aurangzeb—The legacy of Mughal India to British India.

The Marathas after Aurangzeb—The Peshwa—Rise of the Sikhs and their history to Ranjit Singh—The Vijayanagar History 1565-1600—The Naicks of Madura and Tanjore—Mysore—Travancore 1200-1629—The five Swaroopams—the Portuguese, the Dutch and the English in Travancore.

**THE BRITISH PERIOD :** The Portuguese in India—The Dutch in India—The coming of the English—East India Company—The first century of its history in India and at Home—The Anglo-French wars in the Carnatic—Influence of sea power in South Indian History—Clive and Duplex—Lally and the break of the French power in India—The English in Bengal—Plassey and Buxar—Shah Alam, —Shuja Uddaulah and the English—The Diwani of Bengal, Bihar and Orissa—The double Government of Clive.

Growth of the Maratha power—Panipat—Mahadaji Sindhia.

Warren Hastings as Governor of Bengal—The Regulating Act—Hastings as Governor-General—his council and the supreme court—His problems, difficulties and achievement—Pitt's India Act—Lord Cornwallis and the foundation of the administrative system—The rise of the Mysore Sultanate—Cornwallis, Tippu and Travancore—Travancore 1729-1793—The Nizam.

**THE COMPANY—THE SUPREME POWER IN INDIA.** Marquis of Wellesley—His character and statesmanship—The French danger in India—The subsidiary system and the expansion of British dominion—The subsidiary allies—The fall of the Mysore Sultanate—Forming of Madras Presidency—the splitting up of the Maratha Confederacy—Mint—Travancore rebellion—Marquis of Hastings and completion of Wellesley's work—Forming of the Bombay Presidency—Lord William Bentinck and reconstruction—Social amelioration—The Suez Canal.

England, Russia and Afghanistan—Lord Auckland and the first Afghan war—Conquest of Sind—Ranjit Singh of Lahore—Anglo-Sikh war—Annexation of the Punjab by Lord Dalhousie—Punjab as an Indian Province.

Dalhousie's administration—Doctrine of lapse—History of Oudh—Modernisation of India—The Great Sepoy Mutiny—Causes and results.

**INDIA AND THE CROWN.** A review of the Charter Acts—Assumption of control by the Crown—Administrative changes—Relations with Afghanistan—European Politics and Indian affairs—Lord Lytton and the second Afghan war—Ripon's settlement and after—The North Western Frontier—Annexation of Burma.

The Crown and the Indian States—Travancore 1803-1834—Economic changes—Cultural developments—Educational policy—Universities—New religious influences—Local self-government—Social reform and legislation—Indian nationalism—Movement for political reform—The Reforms of 1892—Lord Curzon's viceroyalty—Minto-Morely reforms of 1909—The war of 1914 and its effects—Political agitation—Montagu—Chelmsford Report and the Government of India Act of 1919—Simon Commission Report and the India Act of 1935.

#### BOOKS FOR STUDY.

V. A. Smith : Oxford History of India.

Do. Akbar.

Cambridge Shorter History of India.

Moreland and Chatterjee : Short History of India.

Sarkar : Mughal Administration.

Owen : Fall of the Mughal Empire.

Roberts : Historical Geography of the British Dominions Parts I and II.

Jayne : Vasco da Gama and his successors.

Dodwell : Duplex and Clive.

Keith : Indian Constitutional History.

K. M. Panicker : Government of India and Native States.

V. Nagam Aiyah : Travancore State Manual, 3 Vols.

From 1943.

The whole of Indian History is to be studied. The scope of the examination is indicated by the following syllabuses and Text-books.

(There will be a compulsory map question in this paper).

**INFLUENCE OF GEOGRAPHICAL FEATURES ON INDIAN HISTORY.**

**SOURCES OF INDIAN HISTORY.**

**PRE-HISTORIC INDIA.**—Earliest inhabitants—Palaeolithic and Neolithic men—The metal age—Indus Valley Culture—Its relation to Vedic and Dravidian cultures—Dravidian India.

**VEDIC PERIOD.**—The Indo-Aryan tribes—The Vedas—Social and political condition of the Aryans in the Vedic period—The Epics—Social conditions in Epic period—The Puranas—Caste System—Aryanisation of India.

**RISE OF MAGADHA.**—Relations with Kosala, Avanti and Panchala—Republican States—Social and economic condition of North-east India before the Buddha—Religious ferment in the sixth century B. C.—Mahavira and the Buddha—Persian conquest of North-west India—Literature, economic and social life—Alexander's invasion—the extent of Persian and Greek influence on India.

**THE MAURYAN EMPIRE.**—Authorities for the period—Mauryan chronology—Chandragupta's empire—Mauryan organisation—Megasthenes—Kautilya.

**ASOKA.**—Character and aims—Date of accession—Contemporary powers—Asoka and Buddhism—His inscriptions—Literature and Art—Fall of the dynasty.

**THE SUNGAS.**—Brahminical reaction—The Kanvas—The Andhras—Kharavela.

**THE INDO-GREEK DYNASTIES OF NORTH-WEST INDIA.**—The Sakas and the Pahlavas—Indo-Scythians—Menander—The Kushan Kings—Kanishka—Kanishka as a Buddhist—Mahayana Buddhism—Literature and Art—Expansion of trade and commerce. The Satraps.

**EARLY TAMIL HISTORY.**—Jainism and Buddhism in South India—Internal and foreign trade. Colonisation of Malaya and Indo-Chinese Peninsula.

**THE GUPTAS.**—The period of Golden Age—Literature, Art and Science—Hindu Renaissance—Samudragupta—Chandragupta II—Fa Hien—The Huns—Yasodharman.

**THE VAKATAKAS.**—The Maukharis—The Early Pallavas.

**KING HARSHA.**—Huen Tsang.

**MEDIEVAL HINDU KINGDOMS OF NORTH INDIA**—Nepal—Kashmir—Assam—The Rajputs—Gurjara-Pratiharas—Chandels—Palas—Senas.

**RISE AND EXPANSION OF ISLAM**—Arabs in Sindh—Turki raids—Sultan Mahmud of Ghazni.

**DECCAN HISTORY**—Western Chalukyas—Rashtrakutas—Eastern-Chalukyas—Kakatiyas—Hoysalas—Yadavas—Literature—Culture, religion and art.

**SOUTH INDIA**—The Pallavas—Their origin—Extent of their Empire—Their contribution to Indian culture—Imperial Cholas—Parantaka—Raja Raja the Great—Rajendra Chola I—Later Cholas—Chola administration—Extent of Chola Empire—Chola Art and Religion—The Pandyas—Marco Polo—The Chera Kingdom—Foreign notices of the west coast—Christians in Malabar—Greater India.

**SULTANATE OF DELHI**—Muhammed Ghori and Prithvi Raj—Kutbuddin—Foundation of the Sultanate—The Slave Kings—Muslim conquest of Hindustan—Causes of Muslim success—Il-tutmish—Chingiz Khan—Balban—The Khiljis—Muslim Conquest of the Deccan—Alauddin—His policy. The Tughlaks—Muhammad bin Tughlak—His character and measures—Ibn Batuta—Mongol invasions—Break-up of the Sultanate—Rise of Vijayanagar and Bahmini Kingdoms—Firoz Shah—Timur's invasion—The Sayyids—The Lodis—Delhi and Jaunpur—The problem of the Sultanate—Its administrative system—Religious and Social conditions—Language and Literature—Art and Architecture.

**DISRUPTION OF THE SULTANATE**—Mussalman Kingdoms of Hindustan—The Bahmini Kingdom in the Deccan—Its extent—The Sultans—Muhammad Gawan—End of the dynasty—Its character—Social and economic conditions in the period—The five Sultanates—Their history.

**VIJAYANAGAR**—Its origin—Its foreign relations—Its dynasties—Krishna Deva Raya—Battle of Talikota—Administration—Army—Literature, Art, Religion.

**MUGHAL INDIA.**—The Mughals, North India on the eve of the Mughal conquest—The character of the Mughals—Humayun—Sher Shah—Return of Humayun—Akbar—Character and aims—His place in Indian History—His conquests and organisation of empire—Religious opinions—Relations with Hindus and Christians—Administrative system—Social, economic and religious conditions—Jahangir—Sir Thomas Roe—Shah Jahan—Character and administration—Foreign campaigns—The splendour of his court—Patronage of art and letters—War of succession—Aurangzeb—Early career and character—Religious reaction—Wars in Hindustan—The Afghan and Rajput wars—Rise of the Mahrattas—Aurangzeb and Sivaji—Aurangzeb in the Deccan—Overthrow of Bijapur and Golconda—The Mahrattas after Sivaji—Aurangzeb's failure against the Mahrattas—Aurangzeb's responsibility for the break up of the Mughal Empire—Other causes for the break-up—Successors of Aurangzeb—The Legacy of Mughal India.

The Mahrattas after Aurangzeb—The Peshwas—The Sikhs and their history to Ranjit Singh—Vijayanagar History 1565 to 1660—The Naicks of Madura and Tanjore—Mysore—Travancore 1200 to 1729—The five Swaroopams—The Portuguese, The Dutch and the English in Travancore.

**THE BRITISH PERIOD.**—The Portuguese in India—The Dutch in India—The coming of the English—The first century of the English East India Company in India and at home—The Anglo-French Wars in the Carnatic—Influence of Sea power in South Indian history—Clive and Dupleix—Lally and the break up of French power in India—The English in Bengal—Plassy and Buxar—Shah Alam—Shuja-ud-Doulah and the English—The Diwani of Bengal, Bihar and Orissa—The double Government of Clive.

Growth of the Mahratta power—Panipat—Mahadaji Sindia.

Warren Hastings as Governor of Bengal The Regulating Act—Hastings as Governor General—His Council and Supreme Court—His problems, difficulties and achievements—Pitt's India Act—Lord Cornwallis and the foundation of the administrative system—The rise of the Mysore Sultanate—Cornwallis, Tippu and Travancore—Travancore 1729—93—The Nizam.

THE COMPANY THE SUPREME POWER IN INDIA—Marquis of Wellesley—Character and statesmanship—The French danger in India—The subsidiary system and expansion of British Dominion in India—The subsidiary Allies—The fall of the Mysore Sultanate—Forming of Madras Presidency—The splitting up of the Marhatta Confederacy—Minto—Travancore rebellion—Marquis of Hastings and the completion of Wellesley's work—Forming of Bombay Presidency—Lord William Bentinck and reconstruction—Social amelioration.

England, Russia and Afghanistan—Lord Auckland and the First Afghan War—Conquest of Sind—Ranjit Singh—Anglo-Sikh Wars—Annexation of the Punjab—Punjab as an Indian Province.

Dalhousie's administration—Doctrine of lapse—History of Oudh—Modernisation of India—The Great Sepoy Mutiny—Causes and results.

INDIA UNDER THE CROWN—A review of the Charter Acts—Assumption of control by the Crown—Administrative changes—Relations with Afghanistan—European politics and Indian Affairs—Lord Lytton and the Second Afghan War—Ripon's settlement and after—The North-western Frontier—Annexation of Burma.

The Crown and the Indian States—Travancore 1808-84—Cultural developments—Educational policy—Universities—New religious influences—Local self-Government—Indian Nationalism and movement for political reform—The Reforms of 1892—Lord Curzon's Viceroyalty—Minto-Morley Reforms—The war of 1914-18 and its effects—Political agitation—Montagu Chelmsford Report and the Government of India Act of 1919—Simon Commission Report and the India Act of 1935

#### BOOKS FOR STUDY :

- V. A. Smith : Oxford History of India.
- Moreland and Chatterjee : Short History of India.
- Cambridge Shorter History of India.

#### BOOKS FOR REFERENCE :

- V. A. Smith : Early History of India.
- Garrett and Edwardes : Mughal Rule in India.
- P. E. Roberts : History of British India.
- K. M. Panikkar : Government of India and the Indian States.
- Keith : Constitutional History of India.
- Travancore State Manual (Revised Edition).

#### \* ENGLISH CONSTITUTIONAL HISTORY FROM 1485.

I. Introductory—Brief sketch of the position and powers of the King, the Council and the Parliament at the end of the 15th century.

II. The Tudor dynasty—claims of Henry VII to the throne—measures to strengthen the monarchy.

Henry VIII—Relations with Parliament—The English Reformation—its political nature and constitutional results—Progress of the Reformation under Edward VI and Mary.

The Elizabethan Church settlement, its importance—progress of the constitution under the Tudors—Tudor age, an age of Government by Council.

The importance of the Privy Council in 16th century.

Tudor local administration—The Justices of the Peace—Position of England and abroad at the close of the period.

III. The 17th century—Crown versus Parliament; Prerogative, Law, Religion, Domestic policy, Foreign policy—Blending of issues throughout the period—relations between the Parliament and the first two Stuarts—The Petition of Rights—Personal rule of Charles—the work of the Long Parliament.

England under a written constitution—The constitutional experiments of the Commonwealth—Lessons of the Commonwealth—Restoration, how inevitable.

\* Three questions will be set on the portion covered by Section I, of which one question will be compulsory and seven questions will be set on the rest of the subject of which four will be compulsory.

**The Restoration**—really a revolution—Progress of Parliament during the period—Exclusion bill, beginnings of parties—The Royalist restoration towards the close of the reign of Charles.

The period of the second Stuart absolutism—1685-1688.

Circumstances leading to the Revolution—The peculiar nature of the Revolution of 1688—comparison with the events of 1643—Work of the Revolution Parliament—Importance of the reign of William III and Mary—Influence of continental affairs on English politics during the period—Act of Settlement—Settlement of the fundamental question of sovereignty.

Progress of the constitution under the first two Georges—The Government of the Whig oligarchy—Development of the Cabinet—George III and the constitution—Efforts to arrest constitutional growth—How far successful—Break up of the Whig oligarchy—Dunning's resolution.

The Crown—The Cabinet System in the reign of George IV, William IV and Victoria—Gradual substitution of 'influence' for 'power'—Movement towards parliamentary reform—18th century movement and 19th century movement, contrast.

Reform Bills of 1832, 1867 and 1884—Representation of the Peoples Act of 1918—Act of 1926—position and problems of the franchise at the present day.

Reorganisation of the Judiciary and local self-government in the 19th century—Reform of municipal corporations—Relations between the House of Commons and the House of Lords in the period.

Parliament Act of 1911—Its main provisions—Importance—Nationalisation of Royal revenues, civil list of the Crown, consolidated fund—History of the growth of the National army—The permanent civil service in relation to Parliament.

Development of Public rights—e. g., right to fair trial, right of association, right of meeting, right to free speech.

**Text Books.** (1) Montague. Elements of English Constitutional History, with addition by Aspinall new edition (1936), and  
(2) Adams. English Constitutional History (latest edition).

#### Books

for reference. (1) Chambers: English Constitutional History.  
(2) M. Amos (Sir): The British Constitution, (Heritage of England Series).  
(3) Marriott: English Political Institutions.  
(4) Ramsay Muir: How Britain is Governed.

#### \* EUROPEAN HISTORY FROM 1500 A. D.

(There will be a compulsory map question in this paper.)

I. Introduction—Brief account of the part played in European History by Islam, Feudalism, Empire, the Church and Eastern Empire—Europe at the close of the Middle Ages.

II. Advent of the Turks into Europe—Renaissance—Maritime discoveries—exploration and colonisation—decline of Venice and the Hanseatic League—Transfer of power to the Atlantic states Rise of the national monarchies—France—England—Spain—France under Louis XI—The Christian Conquest of Spain—work of Ferdinand and Isabella—Reformation.

III. French invasion of Italy—Spain under the Hapsburgs—Charles V—France—Spanish rivalry—Charles V and Germany—Religious Questions—Philip II—The Spanish and the Austrian line of Hapsburgs—Philip's work in Spain—Battle of Lepanto—The Counter Reformation—Relations with the Netherlands—Recognition of Dutch independence—Philip II and France—Philip II and England—Decline of Spain.

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\* Three questions will be set on the portion covered by Section I, of which one question will be compulsory and seven questions will be set on the rest of the subject of which four will be compulsory.



The beginnings of Colonial rivalries among the maritime powers.

Close of religious wars in France—hegemony of France in the European state system—France under Henry IV—Richelieu and Mazarin—The Thirty Years' War—Treaties of Westphalia and Pyrennees—Louis XIV and Colbert—The Foreign Policy of Louis XIV—War of the Spanish Succession—Treaty of Utrecht—Rise and Decline of Sweden—Gustavus Adolphus and Charles XII—The struggle for the Baltic—Battle of Fultawa and the treaty of Nystadt—Peter the Great and rise of Russia—Turkish advance into Europe and siege of Vienna—Eastern policy of Russia—Effects on Turkey—The treaties of Kutchuk Kainardji, and Karlowitz—Causes of Turkish decline.

Rise of Prussia—work of the Great Elector of Brandenburg—Charles VI of Austria and the "Pragmatic Sanction"—The Diplomatic Revolution—The Seven Years' War—The Triumph of Prussia and England.

IV. The age of Enlightened Despots—Prussia, Russia and Austria—Fredric the Great—Catherine I, Joseph II—The Partitions of Poland.

V. France under Louis XV and XVI—The Ancient Regime—The French Revolution—its effects—The revolutionary wars—Rise of Napoleon—His work and conquests—Downfall of Napoleon—Congress of Vienna

VI. The Holy alliance 1815-1830—Influence of Metternich—The Liberal movements in France and Europe—The war of Greek independence—Battle of Navarino.

The era of revolutions 1830-1848—Fall of Metternich—The Second Empire in France—National movements—Italian and German Unification—Bismarck and the German Empire—Overthrow of Austria—Franco-Prussian War. The third French Republic.

VII. The Eastern Question—Russo-Turkish relations—The Crimean War—Rise of the Balkan States—Treaty of Berlin, 1878.

Modification of the Berlin settlement. Plans for the reform of Turkey—Abdul Hamid II—His reactionary policy and its results. Incorporation of Eastern Roumania with Bulgaria, 1885—Creation of the Bulgarian Kingdom 1908—Annexation of Bosnia and Herzegovina by Austria.—Hungary 1908—Loss of Crete and Egypt The Balkan wars 1912-1913—The treaty of London 1913.

The German Empire 1870-1914—German culture—Predominance of Germany in Europe—Rivalry with France—Russia and England—Triple Alliance—Dual Alliance—The Triple Entente—Russia and the Slav States—Growth of German influence in Turkey—Austria under Francis Joseph—Sera Jevo—The Treaties of Versailles and Lausanne.

**BOOKS RECOMMENDED FOR SECTION I OF THE SYLLABUS :—**

Emerton : Introduction to the study of middle ages.

Gordon : A Junior History of Europe.

**FOR THE BEST OF THE SYLLABUS :—**

Grant : A History of Europe, Parts III and IV.

**FOR CONSULTATION :—**

Slisson : 20th Century Europe.

Plunkett and Mowat : A History of Europe.

### GENERAL ECONOMICS.

(Students are expected to study economic principles in their relation to Indian conditions.)

I. INTRODUCTORY—Definition of Economics—Scope and method of Economics—economic laws—relation to other social sciences.

Definition of terms—value and price—fundamental laws of demand and supply.

II. THE ORGANISATION OF PRODUCTION—Economic evolution—growth of division of labour from family economy to modern complex system.

Characteristics of modern production—division of labour—private property—free enterprise—monetary exchange—importance of capital—place of the State.

Indian Economic Evolution. The Industrial Revolution in India—Indian agriculture—cottage industries—large scale production, cotton, jute, iron and steel transport.

III. CONSUMPTION.—Wants—diminishing utility—elasticity of demand—standards of living—family budgets.

#### IV. THE THEORY OF PRODUCTION.

THE FACTORS OF PRODUCTION—Land—the Law of Diminishing Returns.

Labour theory of population—the efficiency of labour.

Capital—the functions of capital—the sources of supply of capital.

Organisation—the functions of organisation—risk in the modern world.

LAWS OF PRODUCTION.—Division of labour—size of the business unit—increasing diminishing and constant cost—localisation.

Types of business organisation—the private firm—the joint stock company—industrial combines—co-operative enterprise—government enterprise.

#### V. VALUE.—The market—equilibrium of demand and supply—

Further analysis of demand and supply—market and normal price—joint and composite demand and supply.

Monopoly price.

#### VI. DISTRIBUTION.—General theory—The National Dividend.

Wages—history of wage theory—subsistence theory—wages fund theory—productivity theory—wages and standard of living—workers' and employers' associations.

Interest.

Profits. meanings of profit—theories of profit—analysis of profits.

Rent—Ricardian theory of rent—competitive and customary rents—influence of forms of land tenure.

Quasi-rent—capitalisation.

Problems of distribution—wealth and welfare—inequalities of wealth—socialism.

#### VII. MONEY CREDIT AND BANKING.

Introductory—meaning of money—functions of money—kinds of money—evolution of monetary system.

The value of money—measurement by Index numbers—the Quantity Theory—effects of changes in the value of money, metallic money gold, silver, bimetallism.

Paper money—convertible and inconvertible paper money—methods of note issue.

Credit and banking—the deposit system—banking policy—Central banking.

Foreign Exchange—mechanism of foreign exchange—rates of exchange under Gold Standard and under inconvertible paper currencies.

Money, banking and exchange in India.

#### VIII. INTERNATIONAL TRADE.

The Balance of Trade.

Theory of international trade.

Free Trade and Protection.

The foreign trade of India.

#### IX. PUBLIC FINANCE.

Economic functions of Government.

Public expenditure—public revenues, their classification

General principles of taxation.

Public debts.

**TEXT BOOKS.**

- Clay : Economics for the General Reader.  
 Marshall : Economics of Industry.  
 Todd : Mechanism of Exchange (3rd Edn.)  
 Banerjee : Study of Indian Economics.

**BOOKS FOR CONSULTATION.**

- Anstey : Economic Development of India. (3rd Edn.)  
 Henderson : Supply and Demand.  
 Armitage-Smith : Methods and Principles of Taxation.  
 Benham : Economics.  
 Fair child, Furnis and Buck : Economics.  
 Taussig : Economics (2 Vols.)

**SOCIAL ECONOMICS****GROUP (ii—b)**

The paper in Social Economics shall consist of two parts, (a) Rural Economics and (b) Industrial Economics, both with special reference to India.

**(a) RURAL ECONOMICS :—**

1. Social and Economic structure of the village ; land tenures.
2. Agricultural Economics—subsistence farming and commercial farming—conservation of soil—use of machinery—problems of animal husbandry—irrigation systems.
3. Communications and marketing—development of rural transport—marketing of products—regulated markets, co-operation in marketing
4. Financing of Agriculture—fixed and circulating capital in Agriculture—financing agencies—indebtedness—debt Legislation.
5. Co-operation—history of movement in Europe—in India, credit and non-credit societies.
6. Agricultural labour—wages—under-employment.
7. Cottage industries—organisation and finance—marketing of cottage products—co-operation.
8. Rural reconstruction—voluntary and Government agencies—problems of education and health.

**(b) INDUSTRIAL ECONOMICS.**

1. Organisation of large scale industry—concentration in towns—conditions, social and economic, in towns—relations between town and country—migration.
2. Size and structure of industry—industrial combinations, cartels and trusts—control of industry.
3. Managing agency system.
4. Financing of industry, commercial and industrial banks—State aid to industry.
5. Industrial management and efficiency—scientific management.
6. Organisation of labour in towns—methods of employment—methods of wage payment.
7. Trade Unions—development in England—organisation and activities—conciliation and arbitration.
8. The State and Labour—legislation in regard to hours, wages, conditions of work—problems of Industrial peace.
9. Social conditions—housing, education,—welfare work.
10. Problems of social organisation—Municipal control, health—consumer's co-operation—social work.

# 11. International labour problems—international competition—the International Labour Organisation.

## TEXT BOOKS.

- Rew : Primer of Agricultural Economics.  
 Royal Commission on Agriculture (abridged).  
 Keatinge : Agricultural Progress in Western India.  
 Report of the Royal Commission on Labour.  
 Silverman : Economics of Social Problems.  
 Das : Industrial Organisation and Enterprise.

## FOR REFERENCE :—

- Darling : The Punjab Peasant in Prosperity and Debt.  
 Brayne : Better Villages.  
 Hatch : Up from Poverty in Rural India; Further Upward  
 Robertson : Control of Industry  
 Jones : Administration of Industrial Enterprise  
 O' Brien : Labour Organisation.  
 Lokanathan : Industrial Welfare in India.

## MODERN ECONOMIC HISTORY

### GROUP (ii—b)

Economic History of England and India from about 1700 A. D.

(1) ENGLAND—Condition of England about 1700 A. D.—agricultural system organisation of industry—communications—state of the labouring classes—mercantile policy.

The Industrial and Agrarian Revolutions—developments of communications—revolutions in metallurgical and textile industries—the factory system—the Agrarian Revolution.

Change in state policy—factory legislation—growth of trade unionism—growth of banking—industrial combinations—development of Socialism.

Post-war developments in structure of Industry—State control—commercial and Imperial policy—modern trade unionism.

(2) INDIA.—Condition of India about 1700 A. D.—European Companies and Indian trade—land revenue systems and settlements—development of transport in the 19th and 20th centuries—the Industrial Revolution in India—decline of handicrafts—development of commercial agriculture—famines and famine relief—irrigation works—rise of machine industry, cotton, jute, iron and steel,—commercial and industrial policy—State and Agriculture—money and banking history—history of Indian finance—history of price fluctuations since 1861—the Labour movement.

## BOOKS RECOMMENDED :—

- Knowles : Industrial and Commercial Revolutions in Great Britain during the 19th Century.  
 Do. Economic Development of the Overseas Empire Vol. I, Book II.  
 Ashley : Economic Organisation of England.  
 Gadgil : Industrial Evolution in India.  
 Anstey : Economic Development of India.  
 Bernie : Economic History of the British Isles.

## EARLY INDIAN HISTORY.

### Group (iii-a).

Early History of India up to the end of the Gupta period.

## BOOKS RECOMMENDED :—

E. J. Rapson :—Ancient India.  
 V. A. Smith :—Early History of India.  
 Magdonell—India's Past.

## B. Sc. DEGREE EXAMINATION.

1941.

Syllabuses for Groups i and ii (Mathematics—Main) will be the same as for the Madras University B. A. Degree Examination (Group 1—b).

1942 and 1943.

## MATHEMATICS—MAIN

**PURE GEOMETRY.**—Harmonic ranges and pencils; Complete quadrangles; Solid Geometry of the line and the plane (only fundamental theorems); Elementary Geometrical Conics (based on focus—directrix definition).

**ALGEBRA.**—Inequalities and limits; Convergency of series; The Binomial, Exponential and Logarithmic series; Summation of series depending on these; Partial fractions; Continued fractions and indeterminate equations of the first degree in two unknowns; Determinants; Theory of Equations (standard as in C. SMITH).

**TRIGONOMETRY.**—Properties of quadrilaterals and polygons; Inverse circular functions; Demoivre's Theorem and its immediate applications; Series and products for  $\sin \theta$  and  $\cos \theta$ ; Trigonometry of the complex variable (only working knowledge); Summation of series.

**ANALYTICAL GEOMETRY.**—Oblique axes; Systems of circles; General equation of the second degree and its reduction; Parabola, Ellipse, Hyperbola, Confocal conics, Polar co-ordinates.

**CALCULUS.**—Advanced methods of differentiation; Successive differentiation; Taylor's series; Maxima and Minima; Application to curves (tangents, normals, curvature); Definite integrals and applications; Methods of integration; Centres and moments of inertia; Areas; Volumes of solids of revolution, Differential equations with constant coefficients, the right hand side being zero.

**DYNAMICS.**—(a) Coplanar forces; Conditions of equilibrium; Friction; Work; Centre of inertia; Graphical Statics; Simple machines.

(b) Newton's laws of motion and their applications; Dynamics of a particle; Motion in two dimensions; Impact of bodies; Moments of inertia, pendulum (simple and compound).

**ELEMENTS OF STATISTICS.**—Collection and Tabulation of data; Averages; Frequency distribution; Dispersion; Correlation; Sampling (elementary ideas only) (Standard as in Sankaranarayana Pillai's Students' Guide to Statistics).

## GROUP (i—a)

In addition to the portions for Mathematics Main in Group (i—b) the following.—

**ANALYTICAL GEOMETRY OF THREE DIMENSIONS.**—Plane and the Sphere (in Cartesian Co-ordinates).

**ALGEBRA.**—Infinite series and sequences; Theory of numbers; Probability. Symmetrical functions of the roots of an equation.

**CALCULUS.**—Partial differentiation; Asymptotes; Simple curve tracing; Higher methods of integration and applications; Double integrals and applications.

Differential equations with constant coefficients, the right hand side being of the form  $e^{mx}$ ,  $\cos mx$  or  $\sin mx$ .

Linear equation  $\frac{dy}{dx} + Py = Q$ , P and Q being functions of x.

**DYNAMICS.**—Virtual work; D'Alembert's principle; Motion of a rigid body about an axis;

**HYDROSTATICS.**—Pressure; Centre of pressure; Conditions of equilibrium of a floating body.

**ASTRONOMY.**—Celestial Sphere; Astronomical co-ordinates; Earth; Apparent motion of the sun; Earth's motion round the sun, Latitude and Longitude; Time and Equation of time; Refraction, Parallax. Aberration; Kepler's laws and Newton's deductions; Precession and Nutation; Moon; Eclipses and Ecliptic limits; Principal Constellations; Instruments (the Clock, Transit circle, Equatorial, Sextant, Transit Theodolite). Standard as in Dr. H. Subramonia Iyer's **ASTRONOMY**.

### Mathematics- Main (Revised Syllabus).

From 1944.

**PURE GEOMETRY.**—Harmonic ranges and pencils; Complete quadrangle: Solid Geometry of the line and the plane (only fundamental theorems): Elementary Geometrical Conics (based on focus—directrix definition).

**ALGEBRA.**—Inequalities and limits; Convergency of series; The Binomial, Exponential and Logarithmic series; Summation of series depending on these; Partial fractions; Continued fractions and indeterminate equations of the first degree in two unknowns; Determinants; Theory of Equations (standard as in C. SMITH).

**TRIGONOMETRY.**—Properties of quadrilaterals and polygons, Inverse circular functions; De Moivre's Theorem and its immediate applications; Series and products for  $\sin \theta$  and  $\cos \theta$ ; Trigonometry of the complex variable (only working knowledge) Summation of series.

**ANALYTICAL GEOMETRY.**—Oblique axes; Systems of circles; General equation of the second degree and its reduction, Parabola, Ellipse, Hyperbola, Confocal conics, Polar co-ordinates.

**CALCULUS.** Advanced methods of differentiation; Successive differentiation; Taylor's series; Maxima and Minima; Application to curves (tangents, normals, curvature); Definite integrals and applications; Methods of integration; Centres and moments of inertia; Areas; Volumes of solids of revolution, Differential equations with constant coefficients, the right hand side being zero.

**DYNAMICS.** (a) Coplanar forces; Conditions of equilibrium; Friction; Work; Centre of inertia; Graphical Statics; Simple machines.

(b) Newton's laws of motion and their applications; Dynamics of a particle; Motion in two dimensions; Impact of bodies; Moments of inertia, pendulum (simple and compound).

**ELEMENTS OF STATISTICS.**—Collection and Tabulation of data; Averages; Frequency distribution; Dispersion; Correlation; Sampling (elementary ideas only). (Standard as in Sankaranarayana Pillai's Students' Guide to Statistics).

### DETAILED SYLLABUS.

**STATISTICS.**—(a) Probability, Laws of Addition and multiplication and simple applications.

(b) **DESCRIPTIVE STATISTICS.**—Scope of Statistical Study, collection of data, the method of samples, Random Samples and Representative Stratified samples, Tabulation Graphical Representation. (The candidate will be expected to have a complete knowledge of the Census e. g. Family Budget Studies, Fragmentation of Agricultural Holdings).

(c) **STATISTICAL ANALYSIS.**—The averages and measures of dispersion, limitations in the use of these, the Method of interval Estimation.

Correlation and the fundamental inequality

$0 < r^2 < 1$ . The use of Regression, Equations for purposes of Forecast. Contingency Tables.

(d) The Normal Curve Error, The use of Tables of Normal Curve Student tests, Fisher's  $z$  test and 2. Simple application in Testing Hypotheses.

(e) Curve Fitting, Normal Curve. The Binomial, The Method of Least Squares, Fitting of Parabolic Curves to Time Series, the Use of Arithlog Paper and Log Paper.

(f) Index Numbers and the several forms of these—Mortality Tables.

#### GROUP (i—a)

**ASTRONOMY.**—(optional subject). Celestial Sphere; Astronomical co-ordinates; Earth—Apparent motion of the sun; Earth's motion round the sun; Latitude and Longitude; Time and Equation of time; Refraction, Parallax, Aberration, Kepler's laws and Newton's deductions; Precession and Nutation; Moon; Eclipses and Ecilptic limits; Principal Constellations; Instruments (the Clock, Transit circle. Equatorial, Sextant, Transit, Theodolite) Standard as in Dr. H. Subramonia Iyer's "ASTRONOMY".

**PURE GEOMETRY.** (OPTIONAL subject).

Properties of triangles. Coaxal systems of circles. Inversion. Conical and orthogonal projections. Cross ratios. Projective ranges and pencils. Involution. Non-focal properties of conics. The cross ratio properties of conics. Reciprocation. Duality. Circular points.

#### DETAILED SYLLABUS.

Properties of triangles (isogonal conjugates, Lemoine points and the two Lemoine circles). The coaxal system of circles; limit points. The theory of inversion.

General properties relating to conical and orthogonal projection. Imaginary elements and the principle of continuity. Desargues's theorem of projective triangles. Cross ratios. Projective ranges and pencils are equicross and conversely. Two projective ranges on the same straight line have two self-corresponding points. Harmonic section; harmonic property of the pole and polar of a circle, of the complete quadrilateral and the complete quadrangle. Pappus's theorem.

The involution range and the involution pencil. The double elements are separated harmonically by every pair of corresponding elements. If  $AA^1$ ,  $BB^1$ ,  $CC^1$  are in involution, the ranges  $ABCA^1$ ,  $A_1 B_1 C_1 A$  are equicross and conversely. Two involution ranges on the same line have one and only one common corresponding pair. The definition of the circular points by means of the orthogonal involution pencil.

The study of the conic as projection of the circle. Nonfocal properties common to all conics. Properties of the parabola, ellipse, hyperbola, rectangular hyperbola.

Cross ratio properties of conics. Pascal's and Brianchon's Theorems. Projective, and involution ranges on a conic.

Reciprocation with respect to a conic, and with respect to a circle. Duality.

Every circle passes through the circular points, and every conic through the circular points in a circle. Concentric circles have double contact at the circular points. The cross ratio ( $o-o-AB$ ) depends only on the angle  $AOB$ . The definition of the foci of a conic by means of the circular points.

**STATISTICS.**—(Optional subject).

**PROBABILITY.**—Laws of Addition and Multiplication. Relative Probability Law. Simple applications to Mortality Tables and Life Insurance. Bienme-Tchebecheff Inequality. Associations of Two Attributes. Partial Association.

**STATISTICS. A. DESCRIPTIVE STATISTICS.**—Scope of Statistics-Scientific Inference. Importance of Sampling Methods with illustrations in Social and Economic Studies. Collection of Data—Tabulation—Graphical and Pictorial Representation.

**B. MATHEMATICAL STATISTICS.**—Measurement of Location and Scale Parameters.

Application of these parameters in getting approximate Fiducial Limits. The Shortest Confidence Interval. The different averages—their limitations in defining the Location Parameter. Theoretical Distributions—Binomial, Poisson and the Normal. The Problem of Estimation in these simple cases. The Method of Moments, least Squares and Maximum Likelihood. The Method of Moments in getting Curves of Graduation (Detailed discussion of Pearson's curves is not expected in this. Only the three Types— $X_n$  (J-X) $m$ ,  $pe - px|a$ , and  $e^{-\frac{(x-a)^2}{2}}$  each

be taken up).

Correlation.—Regression Equations involving two variations and simple extension to more than two variables. (The solution based on the method of Expectations).

ANALYSIS OF VARIANCE.—The fundamental idea of splitting Sums of Squares. Direct Application to (i) Analysis of Agricultural yield trials under simple trials (ii) Linear and non-linear regression. (Concept of the Correlation Ratio as the ratio of Variances;) Elementary ideas on Testing Hypotheses.

ANALYSIS OF TIME SERIES.—Index Numbers—Trend—Parabolic Curve fitting.

Interpolation—Differences.

Standard as in Mathematical Statistics Vols. I and II by Kenny and Elements of Statistics by Tippet.

BOOKS RECOMMENDED FOR STUDY :—1. Mathematical Statistics—Rietz.

2. Do. Do. Burgess.

3. Statistics (Revised Edition)—Yule & Kendall.

### Mathematics—Subsidiary.

ALGEBRA AND TRIGONOMETRY. Simple practical applications of the Binomial, Exponential and Logarithmic Series.

Complex numbers, their geometrical representation, De Moivre's theorem and its immediate applications. Use of the expansions of the sine and of the cosine in power series.

Hyperbolic functions.

ANALYTICAL GEOMETRY.—as for B. Sc. (Main,) excluding the general equation of the second degree and polar co-ordinates and also confocal conics and oblique axes.

CALCULUS. Same as for B. Sc. (Main) excluding Taylor's series and in addition the following :—

Differential equations with constant coefficients, the right hand side being of the form  $e^{mx}$ ,  $\cos mx$ ,  $\sin mx$ .

Linear differential equation of the first order, viz.,—

$\frac{dy}{dx} + Py = Q$ , P and Q being functions of x.

### Physics—Main.

1943 and 1944.

Students are expected to be conversant with the elements of differential and integral calculus. The Practical course covering the syllabus should include training in elementary laboratory arts such as glassblowing, soldering and the use of hand-tools.



## DYNAMICS.

I. Displacement, velocity and acceleration. Vector law. Composition and resolution of above vectors. Relative velocity. Angular displacement, velocity and acceleration. Uniformly accelerated motion. Graphical methods for cases of variable velocity. Vertical motion under gravity.

II. Newton's laws of motion. Gravity and gravitation. Weight and mass. Conservation of linear momentum. Reaction due to moving supports and jets. Friction. Motion on a rough incline. Motion of simple connected systems. Trolley and Atwood's machine. Impulse and impulsive forces. Impulse due to jerks in connected systems.

III. Work, energy and power. Indicator diagrams. Application to work done in stretching an elastic string. Conservation of energy. Friction dynamometers. Work done by a couple. Transmission of power by belts.

IV. Experimental laws of impact. Direct impact of smooth spheres. Impact on fixed plane. Loss of energy due to impact.

V. PROJECTILES.—Time of flight and range on horizontal and inclined planes—maximum range. Trajectory a parabola. Simple problems on parabolic motion, including cases of projectiles undergoing impact.

VI. MOTION IN A CIRCLE :—Normal acceleration. Hodograph. Conical pendulum. Application to motion of railway carriages in curved tracks and elimination of lateral thrust. Motion inside smooth spheres. Effect of earth's rotation on gravity.

VII. SIMPLE HARMONIC MOTION :—Definition and fundamental equations. Period of S. H. M. Vertical oscillation of a light spring. The simple pendulum. Composition of S. H. Ms of equal periods and nearly equal periods (a) in the same line. (b) in directions at right angles dealt with geometrically as well as analytically. Lissajou figures.

VIII. MOTION OF A RIGID BODY ABOUT A FIXED AXIS :—Energy of rotating body. Definition of angular momentum and moment of inertia. D'Alembert's principle. Relation between moment of inertia, angular acceleration and moment of external forces. Principle of parallel and perpendicular axes. M. I. and radius of gyration for rod, rectangular and circular laminæ, solid and hollow spheres, solid and hollow cylinders. Applications of the above laws to (1) fly wheel and (2) Atwood's machine having heavy pulley. Compound pendulum. Centre of oscillation and suspension. Principle of Kater's reversible pendulum. Determination of 'g'.

IX. UNITS AND DIMENSIONS :—Fundamental and derived units. Applications of the method of dimensions.

## STATICS.

I. FORCES ACTING AT A POINT :—Parallelogram law of forces. Triangle of forces and its converse, Lami's theorem. Polygon of forces. Resultant of any number of coplanar forces acting at a point. Conditions of equilibrium for the above. Funicular polygon. Graphical methods.

II. PARALLEL FORCES :—Resultant of like and unlike parallel forces. Moment of a force.—Couple. Varignon's theorem for intersecting and parallel forces. Composition of two or more couples. Composition of a couple and a force.

III. COPLANAR FORCES :—Equilibrium under three forces. Reduction of any number of coplanar forces to a single force or a couple. General conditions of equilibrium. Problems involving smooth surfaces.

IV. FRICTION :—Laws of limiting friction. Angle and cone of friction. Cases of equilibrium involving rough plane surfaces.

V. CENTRE OF GRAVITY :—Centre of parallel forces. Centre of mass and centre of gravity. Determination of the C. G. of figures of simple shape, tetrahedron, pyramid, solid and hollow cones, solid hemisphere and hemispherical shell. Centre of gravity of a number of particles (a) in a line, (b) in a plane. Centre of gravity of part of a body. Stability of equilibrium.

**VI. SIMPLE MACHINES :—**Force Ratio, Velocity Ratio, Efficiency and consideration of the above factors for

- (1) Systems of smooth pulleys allowing for mass of moving parts.
- (2) Wheel and axle allowing for friction on bearings.
- (3) Rough screw.

Theory of the common balance.

### HYDROSTATICS AND PNEUMATICS.

**I. FLUID PRESSURE :—**Pressure at a point same in all directions. Pressure at a given depth. Transmissibility of pressure. Pascal's principle. Applications. Free surface of liquid at rest—horizontal. Common surface of two immiscible liquids horizontal. Balancing columns of liquids. Resultant thrust on any plane area immersed in a liquid at rest. Effect of atmospheric pressure.

**II. CENTRE OF PRESSURE :—**Definition and properties. Centre of pressure of :  
(a) any plane area immersed in a liquid in terms of the depth of its C. G. and its radius of gyration about a horizontal axis through the C. G.

- (b) rectangular lamina with one edge in surface.
- (c) triangular lamina with vertex in surface.
- (d) triangular lamina with one side in surface.

Effect of increase of depth in the above cases.

**III. RESULTANT VERTICAL THRUST ON ANY SURFACE :—**Resultant horizontal thrust on any surface. Resultant thrust on a closed surface and Archimedes's principle; laws of floatation. Application to hydrometers.

**IV. STABILITY OF FLOATATION :—**Metacentre and metacentric height. Experimental determination of metacentric height of a ship.

**V. GASES :—**Atmospheric pressure. Barometers and Barographs. Practical units—Standardisation of barometer readings. Decrease of pressure with height in an isothermal atmosphere. Altimeters.

### PROPERTIES OF MATTER.

**I. ELASTICITY OF GASES :—**Boyle's and Charles's laws; Deviation from Boyle's law. Experimental and theoretical investigations—Kinetic theory and explanation of gas laws. The equation of Vander-Waals.

**II. AIR-PUMPS AND GAUGES :—**Piston pumps—Geryk type. Rotary oil sealed pumps. Sprengel and Teopler pumps. Diffusion pumps. McLeod Gauge.

**III. SURFACE TENSION :—**Fundamental experiments and ideas. Definition. Surface energy per unit area. Surface tension same in all directions. Neumann's triangle. Condition for spreading or formation of drops. Pressure inside a spherical drop or bubble. General case of a curved membrane of any shape in terms of its principal curvatures—angle of contact. Surface Tension by capillary elevation or depression with correction for meniscus. Variation of S. T. with temperature. Jaeger's method. Force between two plates having a thin liquid film between; vapour pressure over curved surface; formation of drops. General explanation of S. T. in terms of Kinetic theory.

**IV. Diffusion of liquids and gases :—**Experimental laws—Definition of diffusivity—Analogy with heat conduction. Direct methods of determining diffusivity.

**V. Laws of osmosis :—**Vapour pressure of solution; Boiling and freezing points of solution. Thermodynamic aspects of above phenomena.

**VI. Viscosity of liquids and gases :—**Defn. Poiseuille's law derived dimensionally. Comparison of viscosities by viscometers. Explanation of viscosity of gases in terms of Kinetic theory. Variation with pressure and temperature.

**VII. Elasticity of solids :—**Stress, strain, Hooke's law. Elastic limit; fatigue and after effect. Young's Modulus; Poisson's ratio; Modulus of bulk, Modulus of rigidity and their inter-relations—Accurate method of determining Y for wires and

rods by extensometers—Evaluation of the angle of twist of wires of circular section by a couple at right angles to the length. Methods of determining rigidity modulus by torsion balance and torsion pendulum. Relation between bending moment and curvature of neutral axis—Evaluation of bending of bars of simple cross-sectional area clamped at one end and loaded at the other. Calculation of bending of rods supported symmetrically on knife edges and loaded in centre. I—form girders.

VIII. Compressibility of liquids :—Regnault's experiments and results.

IX. Gravitation :—Newton's law of gravitation. Verification of law from Moon's period of rotation round the earth. Gravitation constant. The experiments of Cavendish and Boys. Mean density of the earth.

#### HEAT.

I. THERMOMETRY :—Liquid and gas thermometers. Their calibration. Resistance thermometry. Thermo-electric thermometry. General principles and utility of each type.

II. EXPANSION :—Expansion of solids liquids and gases. Coefficient of apparent and absolute expansion. Accurate methods of determining above for liquids. Volume and pressure coefficient for gases. Callendar's compensated constant pressure air thermometer—Gas scale—Absolute temperature.

III. CALORIMETRY.—Specific heat—method of mixture. Radiation correction. Specific heat of liquids by method of cooling—Specific heat of gases at constant pressure and constant volume. The experiments of Jolly and Regnault—Variation of specific heat of water with temperature—Experiments of Joule, Rowland and Callendar.

IV. LAWS OF FUSION AND EVAPORATION. Latent heat of fusion. Latent heat of vaporisation. Bunsen's ice calorimeter. Total heat of steam and its variation with temperature. Experimental methods for above.

V. VAPOUR PRESSURE AND VAPOUR DENSITY.—Determination of saturation—vapour pressure of water and other liquids at different temperatures—Laws of unsaturated vapour. Hygrometers. Vapour density by Victor Meyer's method. Triple point curves.

VI. CONTINUITY OF STATE. Amagat's and Andrew's experiments. The equation of Vander-Waals. Determination of critical constants. Corresponding state. Liquifaction of gases. Internal and external work of expanding gases. Joule Thomson experiment and results. Applications.

VII. ADIABATIC AND ISOTHERMAL TRANSFORMATIONS OF GAS.—Relation between the principal specific heats of a gas and the gas constant. Determination of  $\gamma$  and relation between  $\gamma$  and molecular complexity. Equation of the adiabatic of a perfect gas.

VIII. THERMODYNAMICS. I LAW.—Classical experiments of Joule Rowland and Callendar. Work done in isothermal and adiabatic expansions of a gas. Carnot's Cycle-Carnot's theorem.

II LAW.—The Kelvin scale—Relation between the Kelvin scale and the ideal gas-scale. Indicator diagrams for simple steam engine and internal combustion engines. Entropy; Change of entropy for a whole reversible cycle. Entropy—Temperature diagram for Carnot's Cycle. Available energy and entropy. Application of II Law to

(a) Latent heat equation.

(b) Change of boiling point and melting point with pressure. Specific heat of saturated vapour.

IX. CONDUCTION.—Thermal conductivity and thermometric conductivity. Determination of conductivity of good conductors. Lees's disc method for poor conductors. Forbes's method. Conductivity of liquids and gases. General ideas and explanations in terms of kinetic theory.

**X. RADIATION.**—Theory of exchanges. Determination of emissive and absorptive powers. The more common instruments for measurement of radiation. The laws of cooling; Newton's and Stefan's laws. Experimental verification of above laws—Solar constant and effective temperature of Sun.

#### GEOMETRICAL OPTICS.

**I. REFLECTION.**—Reflection from plane, spherical and paraboloidal surfaces—Spherical aberration and methods of minimising it. Accurate methods of determining focal length of concave and convex reflecting surfaces.

**II. REFRACTION.**—Refraction at a single surface—Caustic curve. Refraction through prisms. Thin prisms—Optical constants of a prism: accurate methods. Refraction through thin lenses in contact or separated coaxially. Optical constants of lenses and lens system (thin).

**III. DISPERSION.**—Dispersive power of prisms. Combination of prisms for (a) achromatism (b) direct vision. Chromatic aberration in lenses and lens system. Condition for achromatising two lenses in contact. Constant deviation spectroscope—Rainbow.

**IV. OPTICAL INSTRUMENTS.**—The camera, lantern and epidiascope. Telescope and microscope and eye-piece systems.

**V. PHOTOMETRY.** Bunsen, Lunmer Brodhun and Flicker Photometers—Light standards—Intrinsic luminosity. Candle-power, Lumen, Mean Spherical candle-power.

#### PHYSICAL OPTICS.

**I. VELOCITY OF LIGHT.**—Methods of Romer and Bradley. Methods of Fizeau, Foucault and Michelson.

**II. WAVE THEORY OF LIGHT.**—Huyghens's principle. Application of Huyghens's construction to explain

(a) laws of reflection of plane and spherical waves from plane and spherical surfaces.

(b) laws of refraction of plane waves at plane surface.

**III. INTERFERENCE.**—Young's experiment. Fresnel's bi-prism and bi-plate. Lloyd's fringes. Displacement of fringes due to thin plates. Colours of thin films by reflexion and transmission. Newton's rings by reflexion and transmission. Testing of optical flats. Rayleigh's interferometer.

**IV. DIFFRACTION.**—Huyghen's half period zones and explanation of approximate rectilinear propagation of light. Zone-plates and their properties. Elementary theory of diffraction at (a) straight edge (b) narrow obstacle (c) narrow rectangular slit. Theory of plane transmission grating. Normal incidence and minimum deviation methods of determining  $\lambda$ . Dispersive and resolving power of gratings.

**V. POLARISATION AND DOUBLE REFRACTION.**—Polarisation by reflexion; Brewster's law. Pile of plates. Double Refraction through calcite and quartz; Huyghens's theory of double refraction. Construction of wave surfaces and discussion of results in simple cases—application to Nicol's prism and Wollaston's prism. Experimental method of determining  $\mu_o$  and  $\mu_e$  using prisms. Plane, circular and elliptically polarised light. Their properties and methods of identification; uses of quarter wave and half wave plates. Rotation of plane of polarisation; Fresnel's explanation. Half shade polarimeter.

**VI. SPECTROSCOPY.**—Types of spectra—Emission and absorption spectra—Infrared and ultra violet regions—Spectral series—Doppler effect.

## SOUND.

I. Wave propagation—Analytical expressions for progressive and stationary Waves—Transverse and Longitudinal waves.

II. Expression for velocity of propagation of sound in a gas. Laplace's correction—Effect of pressure, temperature and humidity. Discussion of out-door and Laboratory methods for accurate determination of velocity.

III. Reflexion and Refraction of sound. Effect of wind and temperature gradient. Doppler effect in sound due to relative-motion, wind and reflexion.

IV. Interference and Diffraction of sound waves—Analogy with similar phenomena in light. Beats—Quinke's experiment—Comparison of nearly equal or multiple frequencies by Lissajou's figures.

V. Free and forced vibration-Resonance-Resonators—Quality of sounds—Musical scale—Mean scale temperament—Analysis of complex notes and vowels. Concord and discord.

VI. Speed of transverse waves along a flexible cord. Laws of transverse vibrations of strings-Meide's experiment. The sonometer. Quality of stringed instruments—The vibration microscope.

VII. Speed of longitudinal waves in a solid rod. Kundt's tube and its applications to determination of acoustic constants.

VIII. Vibrations of gas columns—Reflexion from open and closed ends. End-correction—Organ pipes. Overtone—upper Partial's—Experiments on pressure changes and motion of air in organ pipes—Manometric and other sensitive flames. Maintenance of vibration by heat. Electrically maintained tuning forks.

## MAGNETISM.

I. Forces on a magnet in a magnetic field. The standard A and B positions of Gauss. Verification of the inverse square law. Deflexion and vibration magnetometers. Determination of the axis and the moment of a magnet. Mutual forces between two short magnets in standard positions. Magnetic potential. Potential due to a short magnet. Magnetic shell. Intensity of magnetisation and strength of shell. Potential due to a magnetic shell.

II. Magnetic induction :—Types of magnetic materials. Relation between B and H. Magnetic susceptibility, permeability and their measurements by magnetometer method. B-H : I-H curves-Hysteresis loop-Loss of energy per cycle.

III. THE EARTH'S MAGNETIC FIELD :—Accurate determination of the magnetic elements. Variometers. Theory of the earth's field.

## ELECTROSTATICS.

I. The inverse square law : Experiments of Coulomb and Cavendish. Gauss's theorem and its applications to evaluate the field due to a charged sphere, infinite plane and infinite cylinder. Coulomb's theorem—Mechanical force on charged conductors. Faraday tubes. Intensity at a point in terms of Faraday tubes. Electric Potential and its evaluation in simple cases. Relation between potential and intensity. Energy of a system of charged conductors in terms of their charge and potential.

II. CAPACITY :—Spherical condenser. Parallel plate condenser. Condensers in series and in parallel. Variable forms of condenser as used in wireless. The Farad. Specific inductive capacity of a dielectric. Compound parallel plate condenser. Discharge of a condenser. Phenomena of residual and successive discharges and their significance.

III. Absolute electrometer-attracted disc type :—Tilted gold-leaf electrometer. Quadrant-Electrometer (description alone). Measurement of capacity and dielectric constant with an electrometer.

#### IV. Atmospheric electricity. The water dropper. Lightning conductors.

#### CURRENT ELECTRICITY.

I. Magnetic field along the axis of a circular coil conveying a current :— Theorems of Laplace and Ampere. Equivalent magnetic shell. Tangent galvanometers. Helmholtz-Gaugin form. Absolute measurement of current.

II. Mutual force between magnets and currents—Potential energy of a circuit in a magnetic field. Application to moving coil galvanometers, dynamometers and ampere balance. Ballistic galvanometers. Figure of merit.

III. Ohm's law—Specific resistance ; Kirchhoff's laws. Applications to evaluation of current in the arms of a Wheatston's net and in complex cell circuits. Conjugate relations of a net. Accurate measurement of resistance with Post Office Box—Comparison of nearly equal resistances with Carey Foster Bridge Resistance Thermometry, Callendar and Griffiths' Bridge.

IV. Electrolysis :—Conductivity of electrolytes. Ionic migration Kohlrausch's equation. Determination of specific ionic mobilities—Primary and secondary cells. Standard cells.

V. Potentiometer. Accurate measurement of E. M. F. Other indirect uses of the potentiometer for measurement of internal resistance of a cell, current, low resistance—Calibration of ammeters and voltmeters.

VI. Heating effect of current:—Joule's law. General expression for the current in a circuit when there is a source of back E. M. F. Conditions for maximum output in above case. Efficiency of electric lamps. Gas-filled and other types of glow lamps. The arc Watt-meters. The B. T. U

VII. Thermo-electricity :—Seebeck and Peltier effects. Thomson effect—Thermo-electric diagrams. Experimental details for determining the Thermo E.M.F. of a couple accurately. Thermo-electric pyrometers.

VIII. Electro-magnetic induction—Faraday's experiments—Newman's law—Co-efficients of self and mutual induction and calculation from dimensions of coil in simple cases. Practical units. Foucault currents. Arago's experiment. Lenz's law and its applications. The induction coil—Earth inductor. Work done in establishing a current in an inductive circuit. Time constant of a circuit.

IX. Instantaneous value of induced E. M. F. for a coil rotating uniformly in a magnetic field. Method of rectification by commutator. The different types of direct current generators and motors and their characteristics.

X. The theory of alternating current. R. M. S. value of current. Impedance—Reactance. Choking coils. Parts of an A. C. generator. Transformers (elementary theory).

XI. Experimental Wireless. Resonant circuits—E. M. waves from oscillating circuits. Crystal Detector ; The diode and triode valves and their properties. The triode as a detector, amplifier and generator, Diagrams of simple transmitting and receiving sets explaining functions of each component. Microphone, Telephone and Loud speaker.

XII. Discharge through gases and X-rays.—The several stages of discharge—Cathode rays and their properties. The mass and charge of the electron. Positive rays—Mass Spectrograph. Isotopes. X-rays. Hard and soft rays. Coolidge tube.

#### Books for study :—

1. Elements of Dynamics, Statics, and Hydrostatics by S. L. Loney (Cambridge University Press).
2. Elementary Dynamics of the particle and rigid body by R. J. A. Bernard (Macmillan).
3. Properties of Matter by C. J. L. Wagstaff (University Tutorial Series).
4. Sound by J. W. Capstick (Cambridge University Press).
5. Introduction to Advanced Heat by I. B. Hart (Bell and Sons).
6. A text-book on Heat by A. W. Barton (Longmans).
7. A text-book of Light by L. R. Middleton (Longmans).

8. Text-book of Light by G. R. Noakes, (Macmillan).
9. Magnetism and Electricity for students by H. E. Hadley.
10. A manual of practical physics for advanced students by V. Sivarama-krishna Iyer, and P. K. Krishna Pillai.

Books for reference :—

1. An Intermediate Course of Mechanics by A. W. Porter (Murray).
2. An Introduction to Mechanics of Fluids by E. H. Barton (Longmans).
3. Properties of Matter by Champion and Davy (Blackie).
4. Text-book of Sound by E. Catchpool (University Tutorial Press).
5. Heat by Poynting and Thomson (Griffin).
6. Heat for Junior Students by Saha and Srivatsava.
7. Treatise on Light by R. A. Houstoun (Longmans).
8. Magnetism and Electricity by Brooks and Poyser (Longmans).
9. Practical Physics by T. G. Bedford (Longmans).
10. A Text-book of Practical Physics by W. Watson (Longmans).

1945.

Same as for 1944 with the following change :—

Under books for reference add "A Text book of Sound for B. Sc. Students by Ghosh and Rai (Publisher : The Indian Press Ltd., Allahabad).

### PHYSICS—SUBSIDIARY.

1943 and 1944.

I. Theory of the common balance. Accurate methods of measuring densities of solids, liquids and gases. Buoyancy correction in weighing. Barometer—Standardisation. Filter Pump. Air-pumps—Geryk, Rotary oil pump, Mercury pumps. Pressure gauges.

II. Boyle's law. Volumenometer. Compressibility of gases at high and low pressures. The equation of Vander-Waals. Kinetic theory and its elementary applications to Avogadro's hypothesis and gas-laws.

III. Diffusion.—Diffusion of liquids and gases—Graham's and Fick's laws—Co-efficient of diffusion and its measurement.

IV. Osmosis—Vant Hoff's laws—Measurement of osmotic pressure—Isotonic solutions. Theory of osmosis.

V. Viscosity of liquids and gases.—Laws of viscous flow—(Experimental) Measurement of co-efficient of viscosity by capillary flow. Viscometers.

VI. Surface Tension—Simple experiments—Definition. Surface energy—Expression for capillary elevation or depression. Pull on plate or ring by Wilhelmy's Method. Variation with temperature.

### HEAT.

The same as for B. Sc. (Main standard) omitting the following :—

Thermodynamics—Identity of gas-scale and Kelvin scale. Entropy.  
Conduction—Forbe's Method. Lees's method.  
Radiation—Stefan's law and its application.

### OPTICS.

Geometrical Optics—Optical constants of spherical mirrors, thin lenses and prisms. Direct vision spectroscopy—Spectrometer. Dispersive power of prisms—Spectroscopic analysis of light ; simple results.

Physical Optics (i)—Velocity of light—Fizeau's and Foucault's methods.

(II) Huyghens's construction. Explanation of reflexion and refraction of plane waves at plane surfaces.

(III) Interference. Young's experiment. Colours of thin films—Newton's rings by normal reflexion.

(IV) Diffraction—Qualitative ideas—Determination of wave length with plane transmission grating at normal incidence.

(V) Polarisation, Angle of polarisation. Use of Nicol prism and halfwave plate. Polarimeter.

## MAGNETISM.

Determination of the moment of a magnet and the strength of a magnetic field—Deflexion and vibration magnetometers. The earth's field. Determination of  $H$  and dip. Magnetic induction—Permeability—Lines of induction.

## CURRENT ELECTRICITY.

I. The E. M. unit of current. Tangent galvanometer—Absolute measurement of current. Electrodynamics. Moving coil galvanometer. Ammeter and Voltmeter.

II. Ohm's law—Specific resistance. Temperature co-efficient of resistance. Wheatstone's Bridge—P. O. Box.

III. Potentiometer system of measurements, Calibration of ammeter and voltmeter.

IV. Thermo-electric phenomena—Seebeck and Peltier effects. Thermo-electric pyrometry. E. M. F. of a thermo-couple.

V. Heating effect of current. Joule's law. Application to heating and lighting arrangements.

VI. Electrolysis. Study of the action of primary and secondary cells. Accumulators—Standard cell. Conductivity of electrolytes. The equation of Kohlrausch. Ionic migration. Specific ionic mobilities.

VII. Simple experiments on E. M. induction. Induction coil, Dynamo and Motor.

VIII. Discharge through gases and X-rays—Elements of experimental wireless.

## Text Books :—

1. Intermediate Physics by C. J. Smith (Longmans).
2. A Text-book of Physics by W. Watson (Longmans).
3. A Course of Physics H. A. Perkins (Blackie).

1945.

Same as for 1944.

## CHEMISTRY—MAIN.

(a) GENERAL THEORETICAL AND PHYSICAL CHEMISTRY.—The atomic theory. Valency. Methods of determining equivalent, atomic and molecular weights. Atomic numbers. Isotopes. Properties of gases. Transition phenomena from the gaseous to the liquid state. The phase rule. Properties of solutions; osmotic pressure; vapour pressure and freezing and boiling points. Thermo-chemistry. Velocity of reactions and the law of mass action. Theory of electrolytic dissociation. Transport numbers. Conductivity and electro-motive force. The colloidal state. Relation of physical properties to chemical constitution.

(b) INORGANIC CHEMISTRY.—The descriptive portion of Inorganic Chemistry will include the elements and their compounds studied from the standpoint of the Periodic Classification, omitting the detailed study of the rare metals and their compounds.

(c) ORGANIC CHEMISTRY.—Historical development of the science. Methods of purification and the criteria of purity of organic compounds. Analysis of organic compounds. Calculation of empirical and molecular formulæ. Constitutional formulæ. Isomerism and polymerism.

Paraffins; halogen substitution products. Alcohols. Alkylesters of inorganic acids. Ethers. Aldehydes and ketones. Fatty acids, their esters, chlorides, amides, anhydrides. Fats, oils, soaps. Olefines and acetylenes. Unsaturated alcohols, aldehydes, ketones and acids. Amines. Urea. Cyanogen compounds. Organometallic derivatives. Glycol and glycerol. Dibasic acids of the oxalic series. Hydroxy-mono and polybasic and polybasic acids. Stereoisomerism of carbon compounds. Aceto-acetic ester. Aminoacids. Glucose, fructose, sucrose, starch, cellulose.

Benzenes and its homologues. Chloro, nitro, amino and sulphonic derivatives of aromatic hydrocarbons. Phenols, azoxy, azo and hydrazo compounds.

Diazobodies and their reactions. Benzyl alcohol, benzaldehyde, benzoic acid and their derivatives. Acetophenone and benzophenone. Polysubstitution products e. g., di- and tri-phenols, dicarboxylic acids hydroxy-aldehydes, hydroxy-ketones, hydroxy acids.



Laws of orientation of aromatic substitution products. Diphenylmethane, phenyl ethylene, Triphenyl methane, phthaleins, rosanilines, Naphthalene, anthracene and their derivatives. Phenanthrene.

(d) HISTORICAL CHEMISTRY.—A general acquaintance with the historical development of the subject and the detailed study of the contributions to Chemistry of not more than four eminent chemists to be prescribed from year to year.

Prescribed for 1943 & 1944.

- |                     |             |
|---------------------|-------------|
| 1. Kekule.          | 3. Pasteur. |
| 2. William Ostwald. | 4. Haber.   |

(c) PRACTICAL CHEMISTRY :—

- i. Qualitative analysis including the analysis of mixtures of substances.
- ii. Quantitative analysis including (a) the estimation of alkalis, alkaline carbonates and acids by neutralisation (b) determinations involving the use of permanganate, dichromate, iodine and thiosulphate processes (c) the estimation of chlorides and cyanides by titration with silver nitrate and with thiocyanate (d) gravimetric determinations of calcium, barium, magnesium, copper, lead, iron, hydrochloric acid, sulphuric acid, phosphoric acid.
- iii. The determination of molecular weights.
- iv. Preparation of organic substances illustrative of such simple processes as halogenation, nitration, esterification, hydrolysis, oxidation, reduction, diazotisation and condensation.
- v. Identification by chemical and physical tests of simple organic compounds as those illustrated below:

Methyl and ethyl alcohols, acetone, chloroform, formic, acetic, oxalic, succinic, tartaric, citric, benzoic, salicylic and phthalic acids, ethyl acetate, and ethyl benzoate; urea, glucose, benzene and toluene, aniline, phenol; resorcinol, cinnamic acid, benzamide, acetamide, acetic anhydride, phthalic anhydride, methyl aniline dimethylaniline, phyrogallol, benzaldehyde, acetophenone, naphthalene and naphthols.

N. B:—Samples of preparations made by the candidates are expected to be preserved and submitted for inspection at the time of the practical examination.

Books for study :—

1. Text-book of Inorganic Chemistry by Partington (Macmillan).
2. Modern Inorganic Chemistry by Mellor (Longmans).
3. Text-book of Inorganic Chemistry by Lowry (Macmillan).
4. Systematic Inorganic Chemistry by Caven and Lander (Blackie).
5. Physical Chemistry by Lowry and Sugden (Macmillan).
6. Outlines of Physical Chemistry by Senter (Methuen).
7. Organic Chemistry by Kipping and Kipping (Chambers).
8. Systematic Qualitative Analysis by Caven (Blackie).
9. Laboratory Manual of Organic Chemistry, (Part I) by B. B. Dey and M. V. S. Raman (C. S. Press, Madras).
10. Practical Physical Chemistry by Taylor (Oxford University Press).
11. Exercises in Chemical Calculations by Coward and Perkins (Arnold).
12. A Short History of Chemistry by Partington (Macmillan).
13. Practical Organic Chemistry by A. J. Mee (J. M. Dent & sons).

Books for reference :—

1. Introduction to Physical Chemistry by Walker (Macmillan).
2. Text-book of Physical Chemistry by Mee (Heinemann).
3. Text-book of Organic Chemistry by Read (Bell).
4. Do. do. by Holleman (Wiley).

1945.

Same as for 1944 with the following change :—

Omit from the list for 1944 "Exercises in Chemical Calculation" by Coward and Perkin (Arnold); add to the list "Higher Chemical Calculations" by A. J. Mee, (J. M. Dent and sons) and "Elementary Physical Chemistry" by Santiranjana Palit, (San Brothers, 15 College Square, Calcutta).

## CHEMISTRY—SUBSIDIARY.

1943 &amp; 1944.

## I. GENERAL CHEMISTRY.

Atomic Theory. Methods of determining equivalent weights, atomic weights, molecular weights, [vapour density methods] and valency, Vapour pressure of solutions; osmotic pressure, molecular weights in solution, Thermochemistry. Electrolytic dissociation, Conductivity. Law of mass action, velocity of reactions.

## II. INORGANIC CHEMISTRY.

[a] Periodic classification and the modern periodic table.

[b] Preparation [laboratory methods and brief outlines of industrial methods], properties and uses of Hydrogen, Oxygen, the Halogens, Sulphur, Nitrogen, Phosphorus, Arsenic, Carbon, Silicon, Boron and their important compounds.

[c] Sources, extraction, properties and uses of Sodium, Potassium, Copper, Silver, Gold, Calcium, Strontium, Barium, Magnesium, Zinc, Cadmium, Mercury, Aluminium, Tin, Lead, Antimony, Bismuth, Chromium, Manganese, Iron, Cobalt, Nickel, and their most common compounds studied from the periodic stand point.

## III. ORGANIC CHEMISTRY.

Purification of organic compounds, qualitative and quantitative analysis, isomerism, polymerism, methane, ethylene, acetylene, methylhalides, methylalcohol, ethyl alcohol, ether, acetaldehyde, acetone, acetic acid, ethyl acetate, acetamide, oxalic acid, amines, glycerol, fats, oils and soap. Benzene, nitrobenzene, aniline, Diazotisation, Phenol, toluene, benzyl alcohol, benzaldehyde, benzoic acid.

## IV. PRACTICAL CHEMISTRY.

Qualitative analysis of inorganic substances, containing not more than one acid and one base. Simple volumetric analysis with standard solutions of acids, alkalis, potassium permanganate, iodine and sodium thiosulphate.

Books for study :—

1. Introduction to Inorganic Chemistry by Smith [Bell].
2. Intermediate Chemistry by Lowry and Cavell [Macmillan].
3. Text-book of Physical Chemistry by S. J. Smith [Macmillan].
4. Text-book of Organic Chemistry by E. T. Dean.
5. Short system of Qualitative Analysis by Cavan [Blackie].
6. Quantitative Chemical Analysis, [Part 1] by Cavan [Blackie].

Books for reference :—

1. Text-book of Inorganic Chemistry by Partington [Macmillan].
2. A Short History of Chemistry by Partington [Macmillan].
3. Introduction to Organic Chemistry by Holmyard [Arnold].
4. Outlines of Physical Chemistry by Senter [Methuen].

1945.

Same as for 1944.

## BOTANY—MAIN.

1943 &amp; 1944.

**HISTOLOGY.**—The Cell, and its contents. The different types of cell-division in plants. The origin, structure and organisation of the different tissue systems of plants. The development of the Ovule and Anther. Reduction Division. Formation of the embryo and Endosperm.

**TAXONOMY.**—The principles of classification and comparative morphology of flower and fruit of typical members of the following families of flowering plants in addition to those studied in the Intermediate classes.

Magnoliaceæ, Ranunculaceæ, Nymphæaceæ, Cruciferae, Capparidæ, Guttiferae, Sterculiaceæ, Tiliaceæ, Geraniaceæ, Meliaceæ, Rhamnæ, Sapindaceæ, Anacardiaceæ, Rosaceæ, Cambretaceæ, Lythraceæ, Cucurbitaceæ, Umbelliferae, Compositæ, Sapotaceæ, Oleaceæ, Apocynaceæ, Asclepiadaceæ, Boraginæ, Convolvulaceæ, Acanthaceæ, Scrophularinæ, Verbenaceæ, Loranthaceæ, Urticaceæ, Piperaceæ, Orchidæ, Scitamineæ, Amaryllidæ, Commelinaceæ, Aroidæ, Cyperaceæ and Gramineæ.

## ECONOMIC BOTANY.

"A study of the external features, mode of cultivation and economic importance of the following crop plants : Paddy, Coconut, Tapioca and Rubber.

"An account of the following forest products with reference to their sources, availability and utilisation.

Hard woods—Teak and Rosewood.

Soft woods—Bombax, Tetrameles and Vateria.

Bamboos and Reeds.

Sandalwood.

Dammar.

## CRYPTOGAMS.

A general study of the principal groups and the morphology, life-histories and relationship of the following representative types :—

## BACTERIA.

CYANOPHYCEAE.—Oscillaria, Nostoc and Rivularia.

CHLOROPHYCEAE.—Chlamydomonas, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Oedogonium, Cladophora, Hydrodictyon, Vaucheria, Caulerpa, Spirogyra, Zygnema, Desmids, Chara and Nitella, Diatoms.

PHAEOPHYCEAE.—Ectocarpus, Fucus, Dictyota and Sargassum.

RHODOPHYCEAE.—Bastrachospermum and Polyshiponia.

FUNGI.—Phytophthora, Saprolegnia and Phythium.

Rhizopus and Pilobolus.

Saccharomyces.

Erysiphe, Xylaria and Peziza.

Ustilago, Puccinia, Agaricus, Polyporus and Lycoperdon.

## LICHENS.

BRYOPHYTES.—Riccia, Marchantia, Porella and Anthoceros.

Moss—Polytrichum or Funaria.

## PTERIDOPHYTES.

Lycopodium and Selaginella.

Pteris.

Marsilia.

GYMNOSPERMS.—Cycas and Pinus.

PLANT PHYSIOLOGY.—The chemical composition of the plant, the materials of plant food and their sources. Nature of the soil and the nutritive value of its constituents. Role of micro-organisms in the nutrition of plants. Movement of water and gases in plants. Transpiration. Assimilation of carbon and nitrogen. Translocation of assimilatory products. Storage of the reserve food and its utilisation. Enzymes and their action. Respiration. Parasitism and other special modes of nutrition. Growth and development. Movements. Vegetative reproduction. Sexual reproduction and its significance.

ECOLOGY.—Plants in relation to their environment. The principal ecological formations in South India with special reference to Travancore.

GENERAL PRINCIPLES.—Phenomenon of cross-fertilization and its practical application in plant breeding. Variation, Heredity and the principles of Evolution.

PRACTICAL EXAMINATION.—Candidates are expected to be able to make preparations to bring out the structure of any plant included in the syllabus and to describe them with sketches, to make dissections of flowers and to make drawings illustrating their structure, construct floral diagrams and refer the plants to their respective Natural orders. The practical examination will also include (a), examination, description and identification of microscopic specimens, (b) identification of the economic plant products and agricultural crops.

On the first day of the practical examination in the main subject candidates must submit their laboratory note-books containing the drawings and other records

relating to their laboratory training, duly certified by the Professor or Lecturer as bona fide records of regular work done in class together with a representative collection of plants made by the candidates during their period of study.

Botanical excursions for outer-door study of plants shall form a distinct feature of the Botany main course and attendance at these excursions should be deemed as part of their course of study.

#### BOOKS FOR REFERENCE.

Text Books of Botany—Coulter, Barnes and Cowles.  
Text Books of Plant Physiology—Ganong.  
The Flowering and Flowerless Plants—D. H. Scott.  
The Text book of Botany—Strasburger.  
Text Book of General Botany—Smith Overton and Gilbert.  
The Plant Kingdom—Brown.  
Biology of flowering plants,—McGregor Skene.  
General Botany—Hillman and Robbins.  
Cryptogamic Botany Vols. I and II—Gilbert M. Smith.

1945.

Same as for 1944.

#### BOTANY—SUBSIDIARY.

1943 and 1944.

(1) The general principles of classification and the characteristics of the following Natural Orders, in addition to those studied in the Intermediate classes.

Nymphaeaceae, Guttiferae, Geraniaceae, Anacardiaceae, Cucurbitaceae, Umbelliferae, Compositae, Apocynaceae, Aselepiadaceae, Convolvulaceae, Amarantaceae, Urticaceae, Scitamineae, Amaryllideae, and Gramineae.

(2) HISTOLOGY.—The structure of the plant cell and its contents. The origin, nature and development of plant tissues. Primary and secondary tissues and their distribution in the plant body. The structure of the Ovule and the Anther.

(3) CRYPTOGAMS :—Structure and life-history of the following :

Bacteria, Oscillaria, Nostoc, Chlamydomonas, Pandorina, Eudorina, Pleodorina, Volvox, Ulothrix, Oedogonium, Spirogyra, Ectocarpus Polysiphonia Chara. Rhizopus, Puccinia. Agaricus, Lichens. Riccia and Marchantia. Any one Moss. Lycopodium and Selaginella. Any one polystelic Fern, Cycas and Pinus.

(4) GENERAL PRINCIPLES :—A general account of the principles of Evolution, Heredity and Mendelism.

(5) PHYSIOLOGY :—Chemical composition of the plant. Soil and its composition. Photosynthesis, transpiration, respiration, Heterotropic plants, Growth, movements and reproduction. Cross—and self—fertilisation.

#### BOOKS FOR REFERENCE—

Lowson and Sahni—Intermediate Text book of Botany.  
Strasburger's Text book of Botany.  
Structural Botany, Part I and II, by D. H. Scott.  
Fundamentals of Botany by Gsager.

1945.

Same as for 1944.

#### ZOOLOGY—MAIN.

1943 and 1944.

The leading features in the structure, habits, development and affinities of the more common forms included in the following groups. A knowledge of classification of the groups not lower than orders will be expected in the case of Phyla marked.\*

\* PROTOZOA (special attention to be paid to pathogenic forms)

\* COELENTERATA.

**PLATYHELMINTHES** (as illustrated by a Turbellarian, the Liver Fluke and Taenia).

**NEMATODA** (Ascaris and other nematodes parasitic in the human body).

\* **ANNELIDA** (Archiaannelida, Chaetopoda, Hirudinea and Sipunpuloidea).

\* **ARTHROPODA** } Animals of economic importance in these two groups will  
\* **MOLLUSCA** } receive special attention.

**ECHINODERMATA**

**CHORDATA** Hemichorda as illustrated by Balanoglossus

Urochorda ,, a simple Ascidian

Cephalochorda ,, Amphioxus

\*Vertebrata

**PORIFERA** (a knowledge of the groups as illustrated by the types Ascon and Sycon).

**ROTIFERA** (as illustrated by a type such as Brachionus).

**POLYZOA** (as illustrated by Bugula or Flustra and Plumatella).

**PHORONIDIA** (Phoronis).

A comparative study of the organ systems of vertebrates. An elementary knowledge of chordate embryology as illustrated by the development of Amphioxus Frog and Chick. A general acquaintance with the more important forms of the Vertebrate fauna of South India and particularly of Travancore, and a first hand acquaintance with the more common forms of invertebrate animal life acquired as a result of field studies will be expected.

A general knowledge of the theories of evolution, heredity and the important principles of geographical distribution.

#### PRACTICAL—

Candidates will be required to identify and describe specimens and preparations illustrating points of Zoological interest in connection with any of the groups mentioned above. The candidates will be required to make dissections and simple microscopic preparations of any of the following types :—

Hydra, Obelia, Plumularia, Sertularia ; Earthworm ; Nereis (external characters); Leech ; Prawn, Hippa, Crab and Squilla (external characters); Scorpion ; centipede (external characters), Cockroach ; grasshopper ; honey bee, bug, mosquito (mouthparts) ; Fresh water mussel ; Pila, Sepia (external characters) ; Amphioxus (sections) Shark (arteries, brain and cranial nerves), Frog : Calotes (Vascular system) ; Pigeon (wing muscles, arteries, brain) : Rabbit or guineapig (arteries, veins and brain and urinogenital system).

Candidates must submit their laboratory record books at the practical examination.

#### BOOKS FOR STUDY :—

1. Parker and Haswell—Text Book of Zoology—2 Vols.
2. Borradaile—Manual of Zoology.
3. Graham Kerr—Evolution.
4. Adams—Introduction to Vertebrates.
5. Patten—Development of the Chick.

#### BOOKS OF REFERENCE :—

1. Sedgwick—Text Book of Zoology—3 Vols.
2. Lang—Text Book of comparative Anatomy—2 Vols.
3. Kingsley—Comparative Anatomy of Vertebrates.
4. Reynolds—Vertebrate skeleton.
5. Hyman's Manual of comparative Vertebrate Anatomy.
6. Wieman—An introduction of Vertebrate Embryology.
7. Lull—Organic Evolution.
8. Biology of the Vertebrates by Walter

**PRACTICAL :—**

Marshall—The Frog.

Marshall and Hurt—Practical Zoology.

1945.

Same as for 1944.

**ZOOLOGY SUBSIDIARY.**

1943 and 1944.

A study of the leading features in the structure, habits and development of the following groups as illustrated mainly by the more<sup>†</sup> important types mentioned below—(A general classification of each phylum will be expected).

**PROTOZOA** :—Amoeba, Polystomella, Actinophrys, Actinomma, Paramecium, Vorticella, Euglena, Monocystis and malarial parasite.

**COELENTERATA**—Hydra, Obelia, Aurelia, Sea Anemone, Alcyonium and Hymenophora.

**PLATYHELMINTHES** :—Liver Fluke and Taenia.

**NEMATODA** :—Ascaris.

**ANNELIDA** :—(Polygordius, Nereis, Earthworm and Leech).

**ARTHROPODA** :—Prawn, Streptosephalus, Peripatus, Cockroach, Scolopendra and Scorpion.

**MOLLUSCA** :—Fresh water mussel, Pila and Sepia.

**ECHINODERMATA** :—Starfish.

**CHORDATA**

Cephalochorda—Amphioxus.

Pisces—Shark, Teleost.

Amphibia—Frog, Newt.

Reptilia—Calotes or Varanus.

Aves—Pigeon.

Mammalia—Rabbit (Dog—for Mammalian Osteology).

A comparative study of Vertebrate anatomy as illustrated mainly by the types mentioned.

An elementary knowledge of the theories of evolution.

**PRACTICAL**—Candidates will be required to identify and describe specimens and preparations illustrating points of zoological interest in connection with any of the groups mentioned above. They will also be required to make dissections and simple microscopic preparations of any of the following types :—

Hydra ; Earthworm ; Nereis (external characters), Leech (external characters); Prawn and crab (external characters); Cockroach ; Bug and honey bee (mouth parts); Scorpion (external characters); Freshwater mussel (external characters and alimentary system), Pila and Sepia (external characters); Shark (arteries); Frog (7th and 10th cranial and sympathetic nerves excepted); Pigeon (wing muscles, arteries and brain); Rabbit or guinea pig (arteries and urinogenital system).

**BOOKS FOR STUDY :—**

1. Borradaile ; Manual of Zoology (Oxford University Press).
2. Shipley and Macbride ; Text Book of Zoology.
3. J. A. Thomson ; Outlines of Zoology.
4. Kerr ; Organic evolution.

**PRACTICAL :—**

1. Marshall—The Frog.
2. Marshall and Hurt ; Practical Zoology.

## REFERENCE :—

1. Parker and Haswell ; Text Book of Zoology. 2 Vols.
2. Lull ; Organic Evolution.

1945.

Same as for 1944.

## TEXT-BOOKS.

## B A. and B. Sc Degree Examinations 1942.

## PART I—ENGLISH.

## Shakespeare—

As you Like it ; Macbeth.

## Poetry—

Milton's Sonnets (Selected in Palgrave's Golden Treasury of Songs and Lyrics).

Wordsworth's Tintern Abbey ;

Keats's Lamia

Browning's Pippa Passes

} From the Longer Poems of the 19th  
Century, 1st series, 1800-1850, Ed. by  
Edward Parker, (Blackie & Son).

## PROSE—

- (a) 20th Century Addresses edited by Dickenson and Sharma (Macmillan).
- (b) Carlyle's Essays (The Wallet Library, Blackie & Son—the essay on Burns and the essay on Boswell's Life of Johnson.)

## Non-detailed study—

- (1) English Short Stories of To-day (published for the English Association by the Oxford University Press) 2 sh. 9 d.
- (2) Edward Thompson's An Indian Day (Macmillan).
- (3) Gibbon's Autobiography (World's Classics).

## PART II—MALAYALAM.

## Non-detailed Prose—

- (1) Premamritam (പ്രേമാമൃതം) by C. V. Raman Pillai, B. A.—Fernandez & Sons, Trivandrum.
- (2) Baladityan (ബാലാദിത്യൻ) Sri Rama Vilasom Press, Quilon.

## Detailed Study—Poetry—

- (1) Krishna Gatha—Kamsasadgathi to end of Udhavaduthu (കൃഷ്ണഗാഥ കംസസാദഗതി മുതൽ ഉദ്ധവഭൂതം) by Cheruseri Namboori—Any press.
- (2) Karnaparvam (കർണപർവ്വതം) by Thunchat Ezhuthachan—Any press.
- (3) Kesaveeyam (കേശവീയം) Cantos 4, 5 and 6, by K. C. Kesava Pillai—S. R. Book Depot, Trivandrum.
- (4) Dakshayagam Kathakali (ദക്ഷയാഗം കഥകളി) by Ravi Varman Tampi—Any press.
- (5) Mayurasandesam (മയൂരസന്ദേശം) by Kerala Varma, Valia Koil Thampuram—Kamala's Book Depot, Trivandrum.
- (6) Ascharyachudamani (അശ്ചര്യചുടാമണി) by K. Kunjukuttan Tham. puran.

**Prose—**

- (1) Prasangatharangini (പ്രസംഗ തരംഗിണി) Part III by P. K. Narayana Pillai, B. A., B. L.
- (2) Keralavarmadevan (കേരള വർമ്മാഭ്യർ) by M. R. Balakrishna Warriar, M. A.,—R. T. Pillai, Chalai.

**PART II—TAMIL.****Poetry—**

Poetical selections omitting Peria Puranam—published by S. M. Jagannatham, Nagercoil.

**Drama—**

Manonmoniam, Acts III, IV. and V, by Professor Sundaram Pillai.

**Prose—Detailed Study—**

- (1) Tamil Pulavarkal Varalaru (17th Century) by S. Somasundara Desikar—Nos. 2, 6, 8, 9, 10, 11, 12, 13, 16, 17, 21, 23, 24, 27, 28, 29, 31, 32, 33, 34 and 35.
- (2) Essay on Tamil by T. Chelvakesavaraya Mudaliar, M. A., Non-detailed Study—
- (1) Oolaka Perumakkal by K. Subramonia Pillai, M. A., M. L. published by Saiva Siddhanta Publishing Coy., Coral Merchant Street, Madras.
- (2) Mukkiya Arasiyal Thittangal by N. R. Subba Iyer M. A., L. T. published by Madras Library Association, Madras.

**PART II—SANSKRIT.**

Sakuntala—Kalidasa.

Magha's Sisupalavadha Canto XVI.

Kadambari Sangraha—Purvabhaga Pages 1—61 of R. V. Krishnamacharya's edition.

Dandin's Kavyadarsa—Pariucheda I.

In connection with the History of Sanskrit Literature a detailed study of chapters 10—14 in Macdonnell's History of Sanskrit Literature (Heritage of India Series) is recommended.

**PART II—HINDI.****Poetry—**

Padyaparijat Part II (Indian Press) omitting Jayasi, Senapati Ratnakar, Ramachandra Shukul and Tripathy.

**Prose—**

Hindi Nibandhamala Part II, Published by Indian Press (Sam. 1990).

**Drama—**

Siva Sadhana by Harikrishna Premi (Bharati Press, Lahore).

**Non-Detailed—**

1. Galpa Samasarinala Part I (Saraswathi Press, Benares).
2. Adars Jivan by Ramachandra Sukul (Nagari Pracharini Sabha).
3. Nari by Siyaramsaran Gupt (Sahitya Sadan, Chirgaon).

**Grammar, History of Language, etc.—**

1. Subodh Hindi Vyakaran by Ramdev (Hindi Bhavan, Lahore).
2. Hindi Sahitya Ka Samkship Itihas, Nandulaxi Vajapai (Indian Press).



## PART II—ARABIC.

Name of Text book.	Author or Editor.	Publisher.
Prose : Abdurrahman Nasir & Surah An Nahl	Jurji Zaidan.  Allama Abdulla Yusuf Ali, C. B. E; M. A; L. L. M. (Cantab).	Abdussomnad & Sons, Book Sellers and Publishers, Surat.  Sh. Muhammad Ashraf, Book Seller and Publisher, Kashmiri Bazaar, Lahore.
Poetry : Majnoon Laila	Ahamed Hashim Beg.	Arabic Library Co., Book Sellers and Publishers Orient Hotel Building Cr. Market, Bombay 3
History of Arabic Literature (First two centuries of Islam)— 'History of Arabic Literature' OR  'Jawahiru-Adab'	Prof. Gib.  Syed Ahamad Hashim Beg. E. H. Palmer, M. A.	University Book Depot, Aligarh. Arabic Library Co., Book Sellers and Publishers, Orient Hotel Buildings, Cr. Market, Bombay 3. Macmillan & Co., Ltd., Madras.
Grammar : Grammar of Arabic Language.		

## PART II.—FRENCH.

- (a) Texts :—Lecons de Sciences by V. Boullat & Chabanas. (Hachette). Le Barrage by Henri Bordeaux (Plon).  
Fecheur d' Islande by P. Loti adapted by L. Senior (O. N. P.) Forces spirituelles de l' Orient by Claude Farrere.  
N. B. The standard of the Unseens should reach the level of Kastner and Marks French Unseens Book III.
- (b) The Second French Paper, Section B, will contain ONE unseen passage for translation from French into English ONLY bearing on the candidates' optional subjects for the B. A. and B. Sc.

## PART II.—SYRIAC.

Prose.—

1. Old Testament; Book of Tobias (whole).
2. New Testament; Epistle of St. Paul to the Philippians (whole).

Poetry.—

Syro-Malabar Breviary, (St. Joseph's Press, Mannanam, 1913 edition, pages 370-378, 407-417).

Grammar.—

Syriac Grammar, Gabriel, St. Joseph's Press, Mannanam,  
History of Syriac Literature.

## B. A. DEGREE EXAMINATION—1942.

## PART III. GROUP iii-b—MALAYALAM.

Early Period.—(1) Ramacharitham, Patalams 17 to 25 (രാമചരിതം)

(2) Kannassa Ramayanam—Uttara Kandam (കണ്ണശ്ശ രാമായണം ഉത്തരകാണ്ഡം). First hundred verses.

(3) Krishna Gatha—Rukmini Swayamvaram (കൃഷ്ണ ഗാഥ രുക്മിണീസ്വയംവരം)

Modern Period :—(1) Ramayanam Champu—Kharavadham and Balivadhham (രാമായണംചമ്പു ക്ഷരവധവും ബലിവധവും).

(2) Kalakeyavadham Attakatha (കാലകേയവധം ആട്ടക്കഥ) by Kottayathu Thampuran—Any Press.

(3) Sivapuram Kilipattu—latter half—സിവാപുരണം കിളിപ്പാട്ടു—Any press.

(4) Manipravala Sakunthalam (മണിപ്രവാളശകുന്തളം) by Kerala Varma Valia Koil Thampuran, B. V. Book Depot, Trivandrum.

Prose :—

(1) Dharmaraja (ധർമ്മരാജാ) by C. V. Raman Pillai, B. A.—Kamalalaya Book Depot, Trivandrum.

(2) Prasangamuktavali (പ്രസംഗമുക്താവലി) by K. R. Krishna Pillai, B. A., B. L., Retired Assistant Secretary, Kayamkulam.

(3) Brahmandapuram (ബ്രഹ്മാണ്ഡപുരണം) published by the the Curator for the publication of Oriental Manuscripts, Trivandrum.

History of Language and grammar :—

- (1) Kerala Paniniyam.
- (2) Comparative Grammar of the Dravidian Languages . Caldwell.
- (3) Bhashabushanam.
- (4) Vrittamanjari.
- (5) A critical survey of Malayalam Language and Literature : A. K. Pisharoty.

History of Literature.

1. Keralabhasha sahitya caritam Parts 1 and 2, by Narayana Panikar R.
2. Bhashacharithram Vol. II by P. Govinda Pillai

Sanskrit as a related Language.

1. Raghuvarma cantos IV to VI.
2. Sakuntalam.
3. The Sanskrit Teacher Part I by K. P. Trivedi.

PART III (Group iii. b) —TAMIL.

Poetry.

1. Perumpanarrupadai
2. Ainkurunuru.
3. Purananuru—Pages 74 to 96
4. Muttollyiram
5. Thirukkural—Chapter 11 to 20
6. Chilapathikaram—Pages 266 to 275.

Madras University  
B. A. selections  
Vol. I.

Poetry	7. Sundarakandom	} Madras University B. A. Sections Vol. II.
	8. Thiruthondar puranam—Thirunalaipovar	
	9. Thiruviruham	
Prose.	1. Tamil Varalaru—K. Sreenivasa Pillai, Parts I and II.	
	2. Kapilar—Madras University Publication.	
Grammar	1. Nannul—Sankara Namacciyyas.	
	2. Yappilakkana—Vinavidai—Visakaperumal Iyer.	

### PART III (GROUP iii-a)—SANSKRIT.

- (a) A. A. Macdonell: Vedic Reader. The following selections.  
 Agni I—I  
 Savitri I—35.  
 Maruts I—85.  
 Visnu I—154.  
 Funeral Hymn—X—14.  
 Pitaras X—15.  
 Gambler X—34.  
 Yama X—135.  
 Aitareya Brahmana, VII—iii and iv.  
 Gautama Dharmasutra—(Text only)—Prasna I corresponding to Chapter I to V.  
 Svetasvataraupanisad. First Adhyaya (Text only.)
- (b) Saktibhadra's Ascaryaoudamani.  
 Bhattanarayana's Venisamhara.  
 Bana: Harsacharita—Ucchvasa III.  
 Patanjali: Mahabhasya I. i.  
 Mahabharata—Prajagara Parva (Chapter 38—40 both inclusive.)  
 According to the Gujarati Printing Press Edition. Bombay.  
 Bhojacampu—Kiskindhakanda—
- (c) History of Sanskrit Literature—  
 Books recommended for study :—  
 Dr. Macdonell's "History of Sanskrit Literature," and "India's Past".  
 Keith's Classical Sanskrit Literature (Heritage of India Series.)
- (d) Syllabus for Historical and Comparative Grammar.

### SYLLABUS FOR INDO-EUROPEAN PHILOLOGY WITH SPECIAL REFERENCE TO SANSKRIT.

N. B. Knowledge, accurate, so far as it goes, but neither extensive nor minutely detailed, is expected under each head.

P. I. E. = Primitive Indo-European; Ind. Ir. = Indo-Iranian; Skt. = Sanskrit; Gk. = Greek; Lat. = Latin; Teut. = Teutonic.

#### A. GENERAL.

I. ELEMENTARY PHONETICS. (a) The organs of speech production and classification of speech-sounds. Quantity accent—sentence—word and syllable accent. Glides.

(b) Phonetic description of all speech-sounds treated in the course. Phonetic transcription.

(c) Sound-change isolative conditional defective imitation and the result of analogy. Meaning of the term 'Law' in Linguistic Science. Dialectal separation. Growth of 'literary languages'. Families of languages. Cognate words and loan words.

II. THE INDO-EUROPEAN FAMILY LANGUAGES.—The original speech and its earliest dialectal divisions. Branches and sub-branches of the Indo-European Family. Some distinguishing characteristics of the Indo-Iranian, Hellenic, Italic, and Teutonic branches.

III. INDO-IRANIAN.—The Indian sub-branch. Dialects of Vedic times. Epic-dialects Classical Sanskrit. Middle Indian Speeches, New Indian Speeches,

## B. PHONOLOGY:

IV. THE P. I. E. VOWEL SYSTEM.—The oldest conditions, primary vowels; changes resultant on accent, secondary vowels and syllabic liquids and nasals. Vowel gradation, quantitative and qualitative, its relation to accent and its bearing on morphology. The latter P. I. E. vowel system prior to the period of languages separation. General treatment of the P. I. E. vowel system in the oldest Ind.-Ir., Gk., Lat. and Teut.

V. The vowel system of Sanskrit in its relation to P. I. E. and to the vowel systems mentioned in IV. Vowel gradation in Sanskrit.

VI. THE P. I. E. CONSONANT SYSTEM.—Classification of the P. I. E. consonants. Earliest dialectal variations; the 'centum' and 'satam' divisions. Treatment of the P. I. E. consonant generally in Ind.-Ir., Gk., Lat. and Teut.

VII. Representation of the P. I. E. consonant-system in Sanskrit Liquids and Nasals. Plosive consonants, Cerebral consonants (Fortunator's Law). Palatal and velar consonants, (The law of palatalization). The law of aspirates (Grassmann's Law). Spirants, Semi-vowels.

VIII. Sandhi, external and internal. Glides in Skt. Anaptyxis (Svarabhakti). Haplogy.

## C. ACCIDENCE.

IX. Word-formation. Base, stem and suffix. Prefix-Infix.

X. Skt. compounds, nominal and verbal.

XI. Skt. suffixes, primary (krt.) and secondary (taddhita).

XII. NOMINAL DECLENSION.—P. I. E. conditions. Number. Grammatical Gender. Case and case-endings. P. I. E., case-endings. Syncretism. Contamination. Classification of noun declensions according to suffix. Vowel and consonant-stems.

XIII. THE NOUN DECLENSIONS IN SKT. Treated historically and comparatively with reference to P. I. E. Gk., Lat. and Teut. Philological explanation of all case-endings. Comparison of adjectives and formation of adverbs treated philologically.

XIV. NUMERALS.—Philological treatment of the Skt. numerals.

XV. PRONOUNS AND PRONOMINAL ADJECTIVES.—The Skt. pronouns and pronominal adjectives treated philologically with reference to P. I. E., Gk. Lat. and Teut.

XVI. THE VERB.—The P. I. E. verbal-system generally treated; voice, mood, tense, augment, reduplication, personal endings. Thematic and Athematic stems. Types of verbal action.

XVII. The Skt. verb in its relation to the P. I. E. verbal system. Present, perfect, aorist and future systems in Skt. Transfer from the athematic to the thematic class. Periphrastic formations. Analogy in the Skt. verbal system. Derivative verbs—causative, denominative, desiderative, intensive.

XVIII. Voices, moods and tenses in Skt. Infinitive verbal formations.

## B. A. AND B. Sc. DEGREE EXAMINATION—1943.

## PART I—ENGLISH.

- Shakespeare: As You Like It, Hamlet.  
 Poetry: Milton's Sonnets in the Golden Treasury of Songs and Lyrics,  
 Goldsmith's Retaliation, Wordsworth's Tintern Abbey,  
 Arnold's Scholar Gipsy, Shelley's Ode to West Wind,  
 Browning's Saul.  
 Prose: Carlyle's Essays on Burns and Boswell (Bläckie). The Way of  
 Progress edited by Ram Saran Das (Oxford).

**Non-detailed Texts:** Hardy's *The Woodlanders* (Macmillan). Tagore's *Sacrifice* and other plays (Macmillan). Queen Elizabeth (Blackie).

**PART II—MALAYALAM.**

**Detailed Study:**

- Poetry.**
1. Krishnagatha—Soubhadrikam (any Press).
  2. Dronaparvam by Thunchat Ezhuttaccan (any Press).
  3. Bhashakumara Sambhavam, Cantos 3 and 5 by A. R. Rajaraja Varma, (B. V. Book Depot, Trivandrum).
  4. Nalacharritham Attakkatha 3rd Day's story, Kamalalaya Book Depot, Trivandrum.
  5. Navamukulam by N. Gopala Pillai, Sri Vilas Press, Trivandrum.
  6. Malavikagnimitram Natakam by A. R. Rajaraja Varma (B. V. Book Depot, Trivandrum).

**Detailed.**

- Prose:**
1. St. Francis of Assisi by A. John, B. A. (Sri Rama Vilasom Press, Quilon).
  2. Vidyaprakasika by P. Ananthan Pillai (A. R. V. Press, Trivandrum).

**Non-detailed.**

- Prose:**
1. Vidhivilasom by A. P. Parameswaran Pillai (Lekshmi Vilasom Book Depot, Trivandrum).
  2. Kalidasan by Vadakkumkoor Rajaraja Varma (Kamalalaya Book Depot, Trivandrum).

**PART II—TAMIL.**

- Poetry:** Selection in Tamil Poetry published by R. T. Pillai, Chalai.
- Drama:** Manonmaniam Acts III, IV and V by Professor P. Sundaram Pillai.
- Prose:** Periyar Varalaroo, Chapters 26 to 44, pages 141 to 299 by Suddhananda Bharathy published by Ramana Ashram, Thiruvannamalai.

**Non-detailed Study.**

1. Nirmala, translated by Srinivasachariar and published by the Manager, Kalaimakal Office, Mylapore.
2. Thayumanavar Varalaru by K. Subramonia Pillai, M. A., M. L., Professor of Tamil, Annamalai University.

**PART II—SANSKRIT.**

Sakuntala—Kalidasa.  
 Magha's *Sisupalavadha*, Canto XVI.  
 Kadambari Sangraha from Mahasvetavrittanta to the end of Purvabhaga of R. V. Krishnamachariya's edition.  
 Dandin's *Kavyadarsa*—Paricheda I.

In connection with the History of Sanskrit Literature a detailed study of chapters 10-14 in Macdonell's *History of Sanskrit Literature* and Keith's *Classical Sanskrit Literature* (Heritage of India Series) is recommended.

**PART II—FRENCH.**

1. *Le Barrage* by Henry Bordeaux (Nelson).
2. Selections from Andre Mauprios edited by Brown (Nelson).
3. *De Bloous* by Erckmann Chatrian edited by Ropes (Cambridge University Press).
4. *Hernani* by Victor Hugo edited by Finch and Gardiner (O. U. P.)

**PART II—SYRIAC.**

Same as for 1942.

## PART II—HINDI.

- Poetry: Padyaparijat, Part II (Indian Press) omitting Jayasi, Senapati, Ratnakar, Ramachandra Shukul and Ram Naresh Tripathy.
- Prose: Hindi Nibandhamala Part II published by Indian Press (Sam 1990).
- Drama: Ajit Sinh, by Caturasen Sastri (published by Motilal Banarasidas, Lahore).
- Non-detailed: 1. Galpa Samsarmala, Part I (Saraswathi Press, Banares).  
2. Sankshipt Atmakatha (published by Sasta Sahitya Mandal, Delhi).  
3. Nari by Siyaramsaran Gupt (Sahitya Sadan, Chirganv).
- Grammar: 1. Sankshipt Hindi Vyakaran—Kamta Prasad Guru.
- History of Language etc. 1. Hindi Sahitya ka Subodh Itihas by Gulab Rai (Sahitya Ratn Bhandar, Agra).

## PART II—ARABIC.

- Prose: Abdurahaman Nasir—Jurji Zaidan, Abdussamad and Sons, Book-sellers and Publishers, Sayyedwada, Surat.  
Surah Al-maida—Allama Abdulla Usuff Ali, C. B. E., M. A., LL. M. (Cantab)—Shaik Muhammad Ashraff, Kashmiri Bazaar, Lahore.
- Poetry: Majnoon Laila—Ahamad Hashim Beg, Arabic Library and Co., Book-sellers and Publishers, Orient Hotel Building, Bombay.
- History of Arabic Literature: Arabic Literature H. A. R. Gibb, M. A., Literature in Arabic School (An Introduction) of Oriental Studies, University of London, Macmillan and Co., Madras.
- Grammar: Grammar of Arabic Language—E. H. Palmer, M. A., Macmillan and Co., Madras.

## B. A. DEGREE EXAMINATION—1943.

## PART III—GROUP (iii-b) MALAYALAM.

- Poetry: 1. Ramacharitam, Patalams 1 to 10.  
2. Kannassaramayanam, Uttara Kandam, verses 101-200.  
3. Krishna Gatha—Vatsasteyam.  
4. Bhashanaishadha Champu, Part I only.  
5. Ambarishacaritam Kathakali by Aswathi Thirunal Thampuran.  
6. Brahmandapuranam Kilippattu, first half only.  
7. Manipravala Sakuntalam by Kerala Varma Valiya Koil Thampuran (B. V. Book Depot, Trivandrum).
- Prose: 1. Atmasamarpanam by R. Narayana Panikker, (S. T. Reddiyar Press, Trivandrum).  
2. Doothavakkyam, Bhashaparishkarana Committee, Cochin.  
3. Prasangatharangini, Part II by P. K. Narayana Pillai, Sri Rama Vilasom Press, Trivandrum.  
History of Language, Grammar etc., same as for 1942.  
History of Literature—same as for 1942.

## PART III—GROUP (iii-b)—TAMIL.

Same as for 1942.

## PART III—GROUP (iii-a)—SANSKRIT.

Same as for 1942 with the change: 1 that Svetasvataraupanisad Adhyaya 1 is replaced by Kathopanisd, Adhyaya 1;

2 that Bhojacampu, Kislikindhakanda be replaced by Kumarasambhava-campu by Sarfoji II of Tanjore (Sri vanivilasam Press, Srirangam);

3 that Aitareya Brahmana VII—iii and iv be replaced by Aitareya Brahmana, Chapter iii of the Seventh Pancika.

### B. A. (Hons.) & B. Sc. (Hons.) DEGREE EXAMINATIONS.

#### PRELIMINARY, 1943.

The same text books as for Part I Prose and Non-detailed study for B. A. & B. Sc. 1943.

### B. A. & B. Sc. DEGREE EXAMINATIONS 1944.

#### PART I—ENGLISH.

- Shakespeare :** Winter's Tale; Hamlet.  
**Poetry :** Paradise Lost Book II.  
 Goldsmith's Retaliation, Shelley's Ode to West Wind, Browning's Saul.  
**Prose :** The Way of Progress by Ram Saran Das (Oxford)—Selections from De Quincy omitting "Dream—Phantasies". (Ginn and Co.)  
**Non-detailed Texts.** Ordeal of Richard Feverel.  
 Far Away and Long Ago by W. H. Hudson  
 Biography of To-day: Longmans.

#### PART II—MALAYALAM.

- Detailed Study**  
**Poetry :** 1. Krishnagatha—Rukmini Swayamvaram (Any Press.)  
 2. Bheeshmaparvam by Ezhuttaccan (Any Press).  
 3. Vijayodayam Kavyam by Pantalattu Thampuran (first three Cantos) S. R. Book Depot, Trivandrum.  
 4. Soundaryapuja by Vennikulam Gopala Kurup.  
 5. Nalacaritam—IV Day's Story, Kamalalaya Book Depot, Trivandrum.  
 6. Vikramorvasiyam—drama —Translated by Kot-tarattil Sankunni.  
**Prose :** 1. Smaranamaudalam by P. K. Narayana Pillai, Sri Rama Vilasom Press, Quilon.  
 2. Prabandhalatika by Dr. K. Goda Varma, Chandra Press, Trivandrum.  
**Non-detailed Prose :** 1. Matangini by Kannan Janardanan, Kamalalaya Book Depot, Trivandrum.  
 2. Indira by K. Damodaran, Sri Rama Vilasom Press, Quilon.

#### PART II—TAMIL.

- |                |  |       |     |
|----------------|--|-------|-----|
| <b>Poetry.</b> | 1. Silappadikaram—Adaikka'akkatai                  | lines | 219 |
|                | 2. Kuruntogai— not prescribed in the previous year | "     | 50  |
|                | 3. Sirupanaruppadai                                | "     | 269 |
|                | 4. Kambaramayanam Mayasitaippadalam                | "     | 300 |
|                | 5. Kumaraguruparar's Kosikkalambagam               | "     | 40  |
|                | 6. Parikkatai—Valampadu Tiram                      | "     | 100 |
|                | 7. Tirukkural—Chapters 64 to 70                    | "     | 140 |
|                | 8. Chintamani—Vinalayar Ilambagam                  | "     | 300 |
|                | 9. Pefiyapuranam Tirugnanasambaudar Puranam        | "     | 160 |
|                | 10. Purananuru                                     | "     | 100 |

The above selections will be published by the University of Madras.

**Drama.** Kalavathi (all poetical stanzas in the drama to be omitted) by V. G. Suryanarayana Sastry B. A. published by V. S. Swaminathan, Madura.

**Detailed Study Prose.** 1. Kamba Nadar by T. Chelvakesaveraya Mudaliar, M. A.

2. Kalai Payil Katturaikal published by Saiva Siddhanta Works, Publishing Society, 6 Coral Merchant Street, Madras.

**Non-detailed.** 1. Kumuthini: Translation of Dr. Rabindranath Tagore's (novel) Kalaimakal Office, Mylapore.  
2. Tamil Noolkalil Pontham by T. V. Kalyanasundara Mudaliar, Murugavel Book Depot., Royapettah Madras,

#### PART II—SANSKRIT.

Same as for 1943.

#### PART II—FRENCH.

1. Selections from Andre Maurois edited by Frown Nelson.
2. Hernani by Victor Hugo edited by Finch and Gardiner O. U. P.
3. Le Blocus by Erckmann-Chatrion Pitt's Series Macmillan. Madras.
4. Le Roman d'un Jeune Homme Pauvre, by Octave Feuillet, edited by J. Lyitte, B.-es—L. Oxford Modern French Series.

#### PART II—SYRIAC.

**Prose.** 1. Old Testament: History of Joseph: Genesis—Chapters XXXVII to XLIII both included.

2. New Testament: Acts of the Apostles: Chapters I to V both included.

**Poetry.** Syro-Malabar Breviary, edition of 1913, pages 370-378; 407 to 417, St. Joseph's Press, Mannanam.

**Grammar.** Gabriel, St. Joseph's Press, Mannanam.  
History of Syriac Language and Literature.

#### PART II—HINDI.

**Prose.** Hindi Madhuri, Part III omitting essays numbers 3, 4, 12, 14 and 17 published by D. B. Hindi Prachar Sabha.

**Poetry.** 1. Kavya Kanan by Pt. Lakshmidhar Sastri Matilal Benarsidas, Saidnitha Bazaar, Lahore.

2. Milan by Pt. Ramanaras Tripathi—Hindi Mandir, Allahabad.

**Drama.** Same as for 1943.

**Non-detailed.** 1. Kalyani by Jaiendra Kumar—Hindi Grandh Ratnakar Karyalay, Girgaum, Bombay.

2. Galpasaussarmala, Part I—Saraswathi Press, Benares.

3. Bapu by Ghanasyamadas Birla, Sasta Sahitya Mandal, Delhi.

**Grammar and History of Literature.** 1. Rachana Chandrodaya Parts I and II by Ramlochan Saran—Pustak Bhandar, Laharia Sarai.



2. Hindi Sahitya Sanskshipt Itihas by Gopal Lal Khanna,  
Indian Press, Ltd., Allahabad.

**PART II—ARABIC.**

Same as for 1943.

**B. A. DEGREE EXAMINATION—1944.**

**PART III—GROUP—(iii—b)—MALAYALAM.**

Same as for 1943 with the changes :

- (1) that Bhashanaishadha Chambu Part I be replaced by Part II ;
- (2) that Ambarishacharitam by Aswathi Thirunal Thampuran be replaced by Pountrakavadham Kathakali by the same author ;
- (3) that Brhamandapuram Kilipattu First half to be replaced by the second half.

**PART III—GROUP (iii—b) —TAMIL.**

Same as for 1942.

**PART III—GROUP (iii—a) —SANSKRIT.**

Same as for 1943.

**B. A. HONS. AND B. Sc. HONS. DEGREE EXAMINATIONS.**

**PRELIMINARY.**

1944.

- Prose : The way of progress by Ram Saran Das—Oxford .  
Selections from De Quincey omitting " Dream Phantasies "—  
Ginn and Co.
- Non-detailed Texts. Ordeal of Richard Feverel.  
Far Away and Long Ago by W. H. Hudson.  
Biography of To-day (Longmans).

**B. A. AND B. Sc. DEGREE EXAMINATIONS—1945.**

**PART I—ENGLISH.**

- Shakespeare. Othello and The Winter's Tale.
- Poetry : Paradise Lost Book II. Retaliation—Goldsmith. Ode to the West Wind. (Shelley),<sup>1</sup> Grammarian's Funeral—Robert Browning .
- Prose : Selections from De Quincey Omitting Dream Phantasies (Ginn and Co.) Learn and Live (an anthology selected by Diwan Chand Sharma) (Oxford University Press.)
- Non-detailed Texts :— Hardy : Far from the Madding Crowd (Scholar's Library) (Mac-Millan).  
Bernard Shaw : Pygmalion.  
Thomas Hardy by William R. Rutland (Blackie and Son. India).

**PART II—MALAYALAM.**

- Poetry : (1) Krishnagatha, Kaliyamardanam and Rtuvarnam.  
(2) Bharatam Kilipattu Sambhavaparyam from Dhartara-strotpatti to Pancalisvayamvaram (both inclusive).  
(3) Citrayogam—Sargas 3 and 4.  
(4) Amrtadhara by Mahakavi Ullur S. Parameswara Ayyar (Selections 1, 3, 6, 7, 10, 15 and 16) R. T. Pillay and Sons. Chalai, Trivandrum.

- (5) Nalacaritam Kathakali—First Day's—Edited by A. R. Raja Raja Varma.
- (6) Mahaviracaritam—Drama—translated by P. Parameswaran Pillay (Chandra Press, Trivandrum.)
- Prose.** (1) Mangalamala, Part V by Appan Thampuran (Mangalodayam Press Trichur).
- (2) Prabandhakalpalata by P. K. Narayana Pillay (Sri Rama Vilasam Press Quilon).
- Non-detailed Prose.** (1) Parankippatayali by Major Sardar K. M. Panikkar, B. V. Book Depot, Trivandrum.
- (2) Ramarajabahadur Part I by C. V. Raman Pillay (B. V. Book Depot, Trivandrum).

## PART II TAMIL.

**Selections in Tamil Poetry** (Published by the University of Madras) **Lines.**

Sirupanarrupadai	...	269
Kambaramayanam-Mayasitaippadalam	...	300
Silappadhikaram-Adaikkalakkatai	...	219
Kuruntogai	...	50
Kumaraguruparar's Kasikkalambagam	...	40
Pari Katai Valambadu Tiram	...	100
Tirukkural, Chapters 71-77	...	140
Chintamani, Kemasariyar Ilambagam	...	300
Kalarirru Arivar Puranam in Periya Puranam	...	160
Purananuru from 200 to 300 verses (not prescribed in the previous year).	...	100

**Drama** Manonmaniyam I, II and III Acts—Saiva Sidhanta Works Publishing Company, 6 Coral Merchant Street, Madras.

**Prose Detailed Study :** Manicka Vasakar—K. Subramonya Pillai, M. A., M. L., Professor of Tamil, Annamalai University.

**Non-Detailed study.** (1) Thiru Kailaya Yathirai by Sri Cithavananda Swamikal Ramakrishna Mutt, Myslapore.

(2) Byravi—Kalai Mahal Office, Myslapore.

## PART II—SANSKRIT.

Venisamhara.

Magha's Sisupalavadha, Canto XVI.

Kadambari Sangraha from Mahasvetavrttanta to the end of Purvabha of R. V. Krishnamacharya's edition.

Dandin's Kavyadarsa—Pariccheda I.

In connection with the History of Sanskrit Literature a detailed study of Chapters 10-14 in Macdonell's History of Sanskrit Literature and Keith's Classical Sanskrit Literature (Heritage of India Series) is recommended.

## PART II—FRENCH.

(1) Ruy Blas by Victor Hugo, edited by H. L. Hutton. (Clarendon Press).

(2) Four French Plays by N. W. Scott M. A. (Macmillan).

(3) Ce que disent les livres by Faguet (Cambridge U. P.) Macmillan.

(4) Nine French Poets 1820-1880 by Berthon.

**N. B.** From de Vigny's poems, 'La mort du Loup' and 'Les Destinées' are only to be studied. All the poems of the other Poets have to be studied.

## PART II—HINDI.

Will be published later.

## PART II—ARABIC.

Will be published later.

## PART II—SYRIAC

Will be published later.

## B. A. DEGREE EXAMINATION 1945.

## PART III GROUP (iii b)—MALAYALAM.

## Poetry.

- (1) Ramacaritam, Patalanis 13—24 (both inclusive)
- (2) Kannassaramayanam Uttarakandam, verses 201—300
- (3) Krisnagatha Khandavadaham and Rajasuyam.
- (4) Bhasanisadhacambu Part II.
- (5) Paundrakavadham Kathakali by Asvati Tirunal Thampuran.
- (6) Bhagavatam Saptamaskandham.
- (7) Manipravalasakuuntalam by Keralavarma Valiya Koil Thampuran (B. V. Book Depot, Trivandrum).

## Prose.

- (1) Bharatam Gadyam Part I.
- (2) Dutavakyam (Bhasapariskarana Committee, Cochin)
- (3) Selections from Vijnanadipika Essays 1 to 5 and 10 to 14

## Sanskrit :

(Subsidiary)

Same as for 1944.

## PART III GROUP (iii b)—TAMIL.

## Poetry.

1. Perumpanattupadai
2. Ainkurunooru
3. Purananooru Pages 74-96
4. Muttollayiram
5. Thirukural Chapters 11—20
6. Cilappadhikaram pp 259—275
7. Kambaramayana Sundara Kandom
8. Thiru-Tundar Puranam Thirumalai
9. Thiruviruttam

{ Madras University B. A.  
Selections Vol. I.

{ Madras University  
B. A.  
Selections Vol. II.

## Prose.

- (1) Tamil Varalaru—K. Srinivasa Pillai, Parts I and II.
- (2) Kapilar—Madras University Publication.

## Grammar.

- (1) Nannul Sankara Navachirayar Urai.
- (2) Yappilakkana Vinavidai by Visakaperumal Iyer.

## PART III GROUP (iii-a)—SANSKRIT

Same as for 1944.

## B. A. (Hons.) &amp; B. Sc. (Hons.) DEGREE EXAMINATIONS.

## PRELIMINARY—1945.

The same texts as for Part I—Prose and Non-detailed study for B. A. and B. Sc. 1945.

## B. A. (Hons.) DEGREE EXAMINATION,

## BRANCH II—HISTORY &amp; ECONOMICS,

## INDIAN HISTORY

## BOOKS FOR STUDY AND REFERENCE.

V. A. Smith :	Oxford History of India.
Do.	Early History of India.
Moreland & Chatterjee :	Short History of India.
Cambridge History of India	
Macdonnell :	India's Past
Marshall :	Mohenjo Daro (Vol. I Chs. I to VIII).
Dikshitar, V. R. :	Mauryan Polity.
Gopalan R.	Pallavas.
Nilakanta Sastri :	Cholas.
Do.	The Pandyan Kingdom.
K. G. Seshu Iyer :	Chera Kings of the Sangam Period.
P. T. Srinivasa Iyengar :	History of the Tamils.
Garret and Edwards :	Mughal Rule in India.
V. A. Smith :	Akbar.
Sarkar, J.	History of Aurangzeb (in one Vol.)
Ibn Hasan :	Central Structure of the Mughal Empire.
Osten :	Travellers in India.
Bernier :	Travels in the Mughal Empire.
Ranade :	Rise of the Mahratta Power.
Sewell :	A Forgotten Empire.
Ramsay Muir :	Making of British India.
P. E. Roberts :	History of British India.
K. M. Panikkar :	Malabar and the Portuguese.
Do.	Malabar and the Dutch.
Do.	Government of India and the Indian States.
Kineaid & Parasnis :	History of the Maharattas.
Lee Warner :	Native States of India.
Ilbert :	Government of India.
Keith :	Constitutional History of India.
Travancore State Manual (Revised Edition)	

## ENGLISH CONSTITUTIONAL HISTORY.

Candidates are expected to show a critical knowledge of sources.

In addition to the books recommended for the Pass Degree, the following books are recommended so as to bring out the scope of the subject :—

- Adams : English Constitutional History.  
 Medley : English Constitutional History.  
 Stubbs : Select Charters (Introduction).  
 Prothero : Select Documents Illustrative of the Times of Elizabeth and James  
 (Introduction).  
 Tanner : Tudor Constitutional Documents.  
 Tanner : English Constitutional Conflicts of the 17th Century.  
 Gardiner : Select Documents of the Puritan Revolution (Introduction).  
 Robertson : Select Statutes, Cases and Documents.  
 Dicey : The Privy Council.  
 Dicey : The Law of the Constitution.  
 Percy : The Privy Council under the Tudors.  
 Pollard : Evolution of Parliament.  
 Pollard : Factors in Modern History.  
 Jennings : Cabinet Government.  
 Hewart : The New Despotism.  
 Ramsay Muir : How Britain is Governed.

Maitland : Constitutional History.

Adams and Stephens : Select Documents of English Constitutional History.

Jennings : The Law and the Constitution (1938).

Bagehot : The English Constitution—Oxford University Press (World's Classics)

Laski : Parliamentary Government in England.

#### POLITICS—GENERAL.

The course shall comprise (a) a study of the development of political thought from Plato and Aristotle to the present day and (b) a study of the constitution of the important States at the present day. The following books are recommended :—

#### A. POLITICAL THEORY.

Dunning : A History of Political Theory, Vols. I to IV.

Barker : Plato and Aristotle.

Sabine : History of Political Theory.

Joad : Modern Political Theory.

Laski : A Grammar of Politics.

Mc Iver : The Modern State.

Coker : Recent Political Thought.

Burns : Political Ideals.

Bonn : The Crisis in European Democracy.

Dicey : Law and Public Opinion in England.

Laski : From Locke to Bentham (H. U. S.)

Barker : From Spencer to Present Day (H. U. S.)

Ward : Sovereignty.

Merriam : Sovereignty since Rousseau.

Barnes : Sociology and Political Theory.

Davidson : From Bentham to Spencer (H. U. S.)

#### B. COMPARATIVE POLITICS.

Fisher : History of Europe.

Jenks : The State and the Nation.

Sidgwick : The Development of European Polity.

Bryce : Modern Democracies, Vols. I and II.

Do. American Commonwealth, Vol. I Part I.

Munro : The Governments of Europe.

Do. The Government of the U. S. A.

Muir (Ramsay) : How Britain is Governed.

Marriott : Mechanism of the Modern State, Vols. I and II.

Headlam Morley : The New Democratic Constitutions of Europe.

Strong, C. F. : Modern Political Constitutions.

Dicey : Law of the Constitution.

Hewart : The New Despotism.

Mc Laughlin : Newest Europe.

Buell : New Government of Europe.

Burgess : Recent Changes in the American Constitution.

Marriott : Second Chambers (Revised Edn.)

Keith : Constitutional History of India.

Eddy and Lawton : The New Indian Constitution.

Frederick Whyte : India a Federation.

Parikkar : Indian States and the British Crown.

Hattersley : A Short History of Democracy.

The Butler Committee Report.

Government of India Act, 1935.

Buell Chase and Valeur : Democratic Governments in Europe.

F. A. Ogg : European Governments and Politics.

Keith : Dominion Autonomy in Theory and Practice.

Report on Indian Constitutional Reforms (1919).  
 The Report of the Joint Select Committee.  
 The Indian Statutory Commission Report.

### HISTORY—SPECIAL SUBJECT.

#### GROWTH OF THE BRITISH EMPIRE.

List of Books for Study and Reference :—

Cambridge History of the British Empire.  
 Lucas : Greater Rome and Greater Britain.  
 Rose A. W. : The Growth of Empire, 1901.  
 Newton : Old Empire and New.  
 Cromer : Ancient and Modern Imperialism.  
 Bryce : Studies in History and Jurisprudence (Chapter on Roman Empire and British Empire compared).  
 Egerton : History of British Colonial Policy.  
 Guest : The New British Empire.  
 Keith : British Colonial Policy.  
 Keith : Imperial Unity and the Dominions.  
 Keith : Dominion Home Rule in Practice.  
 Keith : Speeches and Documents on British Colonial Policy.  
 Lewis : Government of Dependencies.  
 Durham : Report on the Affairs of British North America.  
 Reinsch : Colonial Administration.  
 Seeley : Expansion of England.  
 Curtis : Commonwealth of Nations.  
 Hall : The British Commonwealth of Nations.  
 Lucas : Government of Dependencies.  
 Cromer : Modern Egypt.  
 Hall (W. P.) : Empire of Commonwealth.  
 White : Mandates.  
 Hopson : Imperialism.  
 Lucas : The Partition and Colonisation of Africa.  
 Moon : Imperialism and World Politics.  
 Brand : South Africa.  
 Lyall : Rise and Expansion of British Dominion in India.  
 Mahan : Influence of Sea Power in History.  
 Beer : British Colonial Policy, 1754—65.  
 Gidding : Democracy and the Empire.  
 Keith : Responsible Government in the Dominions (new edition) 3 Vols.

### POLITICS—SPECIAL SUBJECT.

#### FEDERALISM, ANCIENT AND MODERN.

The scope of the study of "Federalism, Ancient and Modern" is indicated by the following books :—

Bryce : The American Commonwealth.  
 Bryce : Modern Democracies.  
 Brunet : German Constitution.  
 Brogan : Government of the United States.  
 Calhoun : Government of the U. S. A.  
 Dicey : Law of the Constitution.  
 Nicholas Murray Butler : United States of America.  
 Garner : American Political Idea and Institutions.  
 Hall : British Commonwealth of Nations.  
 Hamilton : The Federalist.  
 Kennedy : The Constitution of Canada.  
 Moore : The Constitution of the Commonwealth of Australia.  
 Munro : Governments of Europe.

- Newton : Federal and United Constitutions.  
 Warren : The Supreme Court in the U. S. A.  
 Hart : Actual Government in the U. S. A.  
 Adams and Cunningham : The Swiss Confederation.  
 Egerton : Federations and Unions in the British Empire.  
 Freeman : History of the Federal Government in Greece and Italy.  
 Brooks : Government and Politics of Switzerland.  
 Kerr : Law of the Australian Constitution (1925).  
 Lefroy : Canada's Federal System (1918).  
 Vincent : Government of Switzerland.  
 Mattern : Principles of the Constitutional Jurisprudence of the German Republic.  
 Oppenheimer : The Constitution of the German Republic.  
 Willoughby : The American Constitutional System.  
 Border : The Canadian Constitution.  
 Beard : The Supreme Court and the Constitution.  
 Keith : Dominion Autonomy in Practice.  
 Karve : Federation.  
 F. Whyte : India, a Federation.  
 Report of the Joint Select Committee.

#### INDIAN HISTORY—SPECIAL SUBJECT.

##### BRITISH INDIAN ADMINISTRATION.

Text-books for study :—

- Kaye : The Administration of the East India Company.  
 Ilbert : Government of India.  
 Ramsay Muir : The Making of British India  
 Cowell : History and Constitution of the Courts and Legislative Authorities in India.  
 Ilbert : The New Constitution of India.  
 Keith : Speeches on Indian Polity.  
 Keith : Indian Constitutional History.  
 Cambridge History of India, Vols. V and VI.  
 Appadurai : Dyarchy in Practice.  
 Ramaswamy : Law of the Indian Constitution.  
 Blunt : The Indian Civil Service.  
 Venkatarangayya : Local Government in British India.  
 Axoli : Early Revenue History of Bengal and the Fifth Report (1917).  
 Fifth Report of the Select Committee, the House of Commons, Madras Part.  
 M. Ratnaswami : The British Administrative System in India (1939).

#### INDIAN HISTORY—SPECIAL SUBJECT.

##### HISTORY OF TRAVANCORE TO 1805 A. D.

Books for Study and Reference :

- K. G. Sessa Iyer : Chera Kings of the Sangom Period.  
 C. Atchutha Menon : Cochin State Manual.  
 Logan : Malabar Manual.  
 V. Nagam Aiyah : Travancore State Manual 3 Vols.  
 T. K. Velu Pillai : Do. (revised.)  
 K. P. Padmanabha Menon : History of Kerala, Vols. I to IV.  
 K. A. Nilakanta Sastri : The Cholas.  
 Do. The Pandyan Kingdom.  
 Sewell : Sketches of Dynasties of South India.  
 P. Sankunni Menon : History of Travancore.  
 K. N. Sivaraja Pillai : Chronology of the Early Tamils.  
 P. Sundaram Pillai : Some Early Sovereigns of Travancore.  
 T. K. Joseph : Malabar Christian Copper Plates.  
 Ward and Conner : Survey of Travancore and Cochin.  
 K. M. Panikkar : Malabar and the Portuguese.  
 Do. " Dutch.

Galletti : The Dutch in Malabar.

Whiteaway : The Rise of the Portuguese Power in India.

Milne Rae : The Syrian Church in India.

Travancore Land Revenue Manual, Vols. IV and V.

Travancore Devaswom Committee Reports.

Travancore Jenmi Kudian Report.

Butler Committee Report.

Kerala Society Papers I to XI.

Select Inscriptions.

Kanakasabha Pillai : The Tamils 1800 years Ago.

Sir Charles Aitchison ; Treaties and Sanas of British India, Madras Volume.

### SELECT INSCRIPTIONS.

#### A. TRAVANCORE ARCHAEOLOGICAL SERIES.

- Vol. I. pp. 1-17 Three Inscriptions of Ko—Klarunananda dakkar.  
pp. 21-31 Inscription of Parantaka Pandya.  
161-170 Six Chola Inscriptions at Kanya Kumari.  
237-50 Chola Inscriptions.  
291-2 Tirunandikara Inscriptions of Raja Raja II. Three  
Sanskrit Inscriptions from Trivandrum.
- Vol. II. pp. 3-8 Suchindram Inscription of Raja Raja I.  
30-51 Inscription of Bhaskara Ravi Varman.  
60-87 Do. of Sthanu Ravi.  
53-9 Do. Ravi Varman Sangramadhira.  
131-207 The Huzur Office Plates of Thiruvalla.
- Vol. III. pp. 1-28 Mitranandapuram plates and Inscriptions.  
59-65 Manalikkara Inscription of Ravi Kerala Varman.  
46-52 Trivandrum Inscription of Kodai Martanda.  
179-84 Inscriptions of Bhaskara Ravi.
- Vol. IV. 1-6 Mamballi plate of Sri Vallaban Kodai.  
22-65 Kolloor Madam plates of Udaya Martanda Varman.  
69-70 Kadinangulam Inscription of Rama Kerala Varma.  
92-9 Quilon Inscription, K. 653.  
101-4 Suchindram Inscription of Veeru-man-Konda Bhutala  
Vira Ravi Varman.  
127-30 Suchindram Inscription of Raja Raja I.  
152-60 Arrur Copper plate of Ravi Varman.  
100-115 Kanyakumari plate, K 935-6.  
26-8 Martanda Varman's Record, K 935.
- Vol. V. 40-6 Quilon Inscription of K. 278.  
90-2 Tiruvidadancode Inscription of K. 628.  
128-34 Trivandrum Museum Inscription, K. 839.  
201-228 Olai documents of Nayaka invasions.
- Vol. VI. 1-20 Chalapuram Inscriptions.  
93-6 Pattali Copper scroll, K. 971.  
124-30 Cape Camorin Record of Udaiya Martanda Varman.
- Vol. VII. 26-9 Tiruvidadangodu Record of Vira Kerala Varma, K. 871.  
66-75 inscription on Kadamarram Pahlavi cross.

#### B. EPIGRAPHIA INDICA.

- Vol. IV The Inscriptions of Ravi Varma Sangramadhira.

#### C. INDIAN ANTIQUARY.

- Vol. XX. pp. 285-300 Tirunelveli Copper plate of Bhaskara Ravi Varman.

### General Economics.

1. Students are expected to have a grounding in Economics of the standard of the Pass Degree before taking this course.



2. They are also expected to be able to apply economic principles to Indian problems.

# 1. INTRODUCTORY.

Nature of the Science—scope and method of Economics—ethics and economics—wealth and welfare.

Economical terms—fundamental laws of value.

Economic evolution—growth of free enterprise and industry—Indian economic evolution.

Development of economic doctrines.

# II. ORGANISATION OF PRODUCTION.

Characteristics of the modern industrial system—property and contract—money and credit economy—place of the State.

# III. CONSUMPTION.

Development of the theory of consumption—diminishing utility—consumer's surplus—elasticity of demand.

Standards of living—family budgets—Engel's Law.

# IV. THE THEORY OF PRODUCTION.

The Factors of Production.

Laws of Production—large and small scale production—the optimum firm—laws of returns in relation to static and dynamic conditions.

Recent tendencies of business organisation—integration—combination—localisation.

# V. VALUE : GENERAL THEORY OF EXCHANGE AND DISTRIBUTION.

Theory of market price—laws of demand—determination of market price.

Theory of production—analysis of cost—laws of substitution—the time element in production—prime and supplementary cost—short and long period—normal price—joint and composite demand and supply.

Monopoly price—price discrimination.

## THEORY OF DISTRIBUTION.

General principles—marginal productivity.

Theories of wages, interest, profit and rent.

Problems of distribution—wealth and welfare—inequalities of wealth—inheritance—socialism.

# VI. MONEY CREDIT AND BANKING.

Evolution of monetary system.

The Value of money—index numbers—methods of preparing index numbers—Quantity theory.

Systems of currency—metallic and paper.

Banking—evolution of credit—Banking policy—central banking—commercial and industrial banks.

Foreign Exchange—mechanism and theory of foreign exchange.

The Trade Cycle—causes and remedies.

Money, Banking and Exchange in India.

# VII. INTERNATIONAL TRADE.

The Balance of Trade.

Theory of international trade—comparative price levels.

Free trade and Protection—modern trade policies.

# VIII. PUBLIC FINANCE.

The State in relation to economic life.

Principles of public expenditure.

Principles of taxation.

Public debts—short and long period borrowing—conversion schemes.

**BOOKS RECOMMENDED.**

Marshall :	Principles of Economics. Industry and Trade. Money, Credit and Commerce.
Taussig :	Principles of Economics.
Anstey :	Economic Development of India.
Benham :	Economics.
Tailor :	Principles of Economics.

**FOR CONSULTATION.**

Robins :	Nature and Significance of Economic Science.
Knight :	Risk, Uncertainty and Profit.
Wickesteed :	Commonsense of Political Economy.
Henderson :	Supply and Demand.
Dobb :	Wages.
Robertson :	Money.
Keynes :	A Tract on Monetary Reform.
Barret Whal :	International Trade.
Lokanathan :	Industrial Organisation in India.
Coulbourn :	An Introduction to Money. (Longmans)

**Economics—Special Subject.****PUBLIC FINANCE.**

(Including the economic functions of the State, the raising and spending of taxes and Public loans and the regulation of Tariffs.)

**BOOKS RECOMMENDED.**

Bastable :	Public Finance.
Adams :	Finance.
Stamp :	The Principles of Taxation.
Seligman :	Shifting and Incidence of Taxation and Essays on Taxation.
Pigou :	A Study of Public Finance.
Report of the Colwyn Committee on National Debt and Taxation.	
Shah :	Indian Finance During the Next Six Years.
Budget :	Statements of the Government of India since 1910.
Findly Shirras :	Science of Public Finance.
Indian Taxation Committee Report, 1926.	
Vakil :	Financial Developments in India.
Dalton :	Unbalanced Budgets.
Glaisher :	Outlines of Public Utility Economics.
Rangaswamy Iyengar :	Some Trends of Modern Public Finance.

**B. A. (Hons.) Degree Examination -1943.****Branch III.****English Language and Literature.****DIVISION I.****OLD ENGLISH (DETAILED STUDY).**

Anglo-Saxon Reader by A. J. Wyatt ; (Cambridge University Press) :

Selections. I, II (Omit CENTRAL EUROPE AND CLEOPATRA), III, VII (Caedmon), XI (St. Cuthbert), XII, XIV (Laws of Alfred). XXIV, XXVI (omit 6. The Dragon,) XXVIII.

**MIDDLE ENGLISH. (DETAILED STUDY.)**

Middle English Reader by O. F. Emerson (Macmillan.)

The following selections :—

Part I.	A	i and ii.
"	B	i and vi.
" II.	A	v and vi.
"	B	iv and viii.
"	C	iii.

Chaucer : The Prologue to the Canterbury Tales.

## HISTORY OF THE ENGLISH LANGUAGE.

Wyld's Short History of English (latest edition.)

C. T. Onions : Advanced English Syntax.

Wright (J) and (E. M.)

Elementary Old English Grammar.

Elementary Middle English Grammar.

Elementary Historical New English Grammar.

## DIVISION II.

SHAKESPEARE.—(DETAILED STUDY).

The Two Gentlemen of Verona.

Henry IV, Part I.

Much Ado About Nothing.

Othello.

The Winter's Tale.

## GENERAL STUDY.

Plays of Shakespeare.

## MODERN LITERATURE I, BEFORE 1660.

Poetry :—

Wyatt and Surrey. Selections in English Verse—Vol. I.

W. Peacock. World's Classics.

Ballads : The following selections in Peacock—Vol. II.

Sir Patrick Spens.

Chevy Chase.

Robin Hood and the Curtal Friar.

Robin Hood and Alan a Dale.

The Battle of Otterbourne.

The Wife of Usher's Well.

Willie drowned in Yarrow.

The Heir of Linne.

The Babes in the Wood.

Edmund Spenser ;

DETAILED STUDY. The Selections from the Faerie Queen in Renwick's "Spenser" (see below).

GENERAL STUDY. Selections from Spenser by W. Renwick (Clarendon Series, Oxford University Press).

Sir Philip Sidney. Sonnets from Astrophel and Stella in Peacock Vol. I.

Daniel : Care-Charmer Sleep ;

Ulysses and the Syren.

To the Lady Margaret, Countess of Cumberland  
(Peacock Vol. I.)

Drayton. Agincourt : Love's Farewell.

To the Virginian Voyage.

Upon a Bank.

(Peacock Vol. I.)

Shakespeare : Sonnets. (Peacock Vol. I.)

Champion, Donne, Ben Jonson, Herbert and Crashaw, Peacock, Vol. II).

Milton : Selections in the Golden Treasury of Songs and Lyrics.

Prose :—

Mandeville, Malory, Berners, More and Hooker. (Craik's selections in English Prose. Vol. I).

Sidney : APOLOGY FOR POETRY—(DETAILED STUDY).

Bacon : First Twelve Essays.

New Atlantis.

Browne : Religio Medici.

Milton : Areopagitica.



ART VOGLER—(DETAILED STUDY).

Tennyson : Selections in the Golden Treasury.

Lucretius (Peacock, Vol. V).

Northern Farmer : Old style.

Do. New style.

Arnold : The Scholar Gipsy,

THYRSIS (DETAILED STUDY).

Morris : DEFENCE OF GUINEVERE—(DETAILED STUDY).

King Arthur's Tomb.

Prose :—

Scott : The Heart of Midlothian.

Austen : Pride and Prejudice : and Emma.

Lamb : ESSAYS OF ELIA (FIRST SERIES), (Detailed Study); Letters.

Hazlitt : The Spirit of the Age.

Newman : LITERARY SELECTIONS (LONGMANS) DETAILED STUDY.

Pater : Appreciations.

Stevenson : Selected Essays (Oxford University Press).

Thackeray : Henry Esmond.

Meredith : Richard Feverel : The Egoist : Essay on Comedy.

Hardy : Tess of the D'Urbervilles ; Far from the Madding Crowd.

Drama :—

Arnold : Merope.

Swinburne : Atalanta in Calydon.

Shaw : St. Joan.

Drinkwater : Abraham Lincoln.

DIVISION III. SPECIAL PERIOD.

Wordsworth and his Contemporaries.

Poetry :—

Wordsworth. The Prelude. (BOOKS 1, AND 4 FOR DETAILED STUDY).

Coleridge. Selections in Peacock. Vol. IV.

DEJECTION—AN ODE—(DETAILED STUDY).

Scott : Marmion.

Shelley : Prometheus Unbound.

ADONAI—(DETAILED STUDY).

Keats : Endymion.

EVE OF ST. AGNES. (DETAILED STUDY).

Isabella.

Byron : Childe Harold, Cantos 3 and 4.

Don Juan, Cantos 3 and 4.

Landor, Moore : Selections in Ward's English Poets.

Drama :—

Shelley : The Cenci.

Byron : Manfred.

Prose :—

Coleridge and Wordsworth. BIOGRAPHIA AND PREFACES, EDITED BY QUILLER COUCH AND SAMPSON (Cambridge University Press)—(DETAILED STUDY.)

Hazlitt : The English Poets, Essays on the Comic Writers.

Lamb : Essays of Elia and Critical Essays (Edited by Ainger).

Landor : WELBY'S SELECTIONS FROM THE IMAGINARY CONVERSATIONS. (Oxford University Press)—(GENERAL STUDY).

De Quincey. Selections (Blackie and Son).

Shelley. DEFENCE OF POETRY—(DETAILED STUDY).

Southey. Life of Nelson.

Cobbet and Leigh Hunt. Selections in Craik's English Prose. Vol. V.

**The Novel :**

Jane Austen. Persuasion, Northanger Abbey.  
 Lyton. Rienzi.  
 Scott. Kenilworth, Rob Roy. The Bride of Lammermoor.  
 Peacock. Melincourt.

**Branch III.****English Language and Literature.**

1944, 1945 and 1946.

Same as for 1943.

**Branch IV.****Sanskrit Language and Literature**

1943.

**GENERAL PART.****TEXT BOOKS.**

Siddhanta Kaunudi (a) Purvardha—from Stripratyayaprakarana to the end of Apatyadhikara in the Taddhitaprakarana. (b) Uttarardha-Bhradi, Pada-vyavastha and Lakarthaprakarana.

Vidyanatha : Prataparudriya.

Rg. Veda Macdonell's Vedic Reader. Hymns 1 to 5 and X Mandala 14, 16, 34, 86 and 129 ;

Brahmana—Aitareya Brahmana Adhyaya I ;

Upanisad—Chandogyopanisad Adhyaya III.

Yaska's : Nirukta, Naighantuka Kanda, Chapter II.

Sudraka's Mrcchakatika.

Sri Harsa's Nasadhiyacarita, cantos I and II.

Bana's Kadambari—from the Acchodasarovaranana to the end of the Purvabhaga.

Annambhatta's Tarkasangraha with Dipika.

Langaksibhaska's Arthasangraha.

In connection with the B. A. (Honours) Degree Examination in Sanskrit, the attention of students is invited to the following books, though it must be distinctly understood that they are not prescribed as text books.

**Science of language, History of the Sanskrit Language and  
 History of Sanskrit Literature.**

**BOOKS RECOMMENDED FOR STUDY.**

Jespersen : Language, its nature, development and origin.

Giles : Short Manual of Comparative Philology for classical students (Mac Millan).

Tucker : Introduction to the Natural History of Language (Blackie).

Sweet : The History of Language (Temple Primers).

Bloomfield : Introduction to the Study of Language (G. Bell and Sons).

Macdonell : Vedic Grammar for students (Oxford University Press).

Whitney : Sanskrit Grammar (Kegan Paul, Trench, Trubner and Co.)

Uhlenbeck : Manual of Sanskrit Phonetics (Luzace and Co.)

Kaegi : The Rigveda—the oldest Literature of the Indians (Ginn and Co., Boston).

Macdonell : India's Past.

Maxmüller : History of Ancient Sanskrit Literature (Reprint Panini office, Allahabad).

A. B. Keith : 'Classical Sanskrit Literature' and 'Sanskrit Drama, its origin, theory and development.'

**BOOKS RECOMMENDED FOR CONSULTATION.**

Brugmann : Comparative Grammar of the Indo-Germanic Languages, translated by Wright, Conway and Rouse.

- Bopp : Comparative Grammar of the Sanskrit, Zend, Greek, Latin, Lithuanian Gothic, German and Slavonic languages (translated by Eastwic)
- Schleicher : Compendium, translated by Bendall.
- Whitney : Life and Growth of Language.
- „ Language and its study.
- „ Oriental and Linguistic studies.
- Max Muller : Lectures on the Science of Language.
- „ Biography of words.
- Delbruck : Introduction to the Study of Language.
- Car Abel : Linguistic Essays.
- Lefevre : Race and Language.
- Gray : Principles of Indo-Iranian Phonology.
- Macdonell : Vedic Grammar.
- Beams : Comparative Grammar of the Modern Aryan Languages of India.
- Hoernle : Comparative Grammar of the Guarian Languages.
- Arnold : Vedic Metre.
- Goldstucker : Panini, his place in Sanskrit Literature.
- V. A. Smith : Early History of India.
- Schrader : Prehistoric Antiquities of the Aryan Peoples.
- A. B. Keith : Religion and Philosophy of the Vedas and Upanisads (Harvard Oriental Series).
- Winternitz : History of Sanskrit Literature.
- P. S. Deshmukh : The Origin and Development of Religion in Vedic Literature. (Oxford University Press).

#### SPECIAL PART.

#### Vyakarana and Sahitya.

- I. Bhattoji Diksita : Praudha Manorama—Samjua, Paribhasa, Sandhi, Stripratyaya and Karakaprakaranas.
- II. Patanjali : Mahabhasya, Ahnikas (i) to (iii).  
Bhartrhari : Vakyapadiya, Kanda I.
- III. Anandavardhana : Dhvanyaloka.  
Jagannatha Pandita : Rasagangadhara—First Anana only.

#### BOOKS RECOMMENDED FOR STUDY.

- Goldstucker : Panini, his place in Sanskrit Literature.
- Belvalkar : Systems of Sanskrit Grammar.
- Aristotle : Poetics.
- Bain : English Composition and Rhetoric.
- Vaughan : Literary Criticism.
- Winchester : Principles of Literary Criticism.
- Gayley and Scott : Methods and Materials of Criticism.
- S. K. De : History of Sanskrit Poetics.

#### BOOKS RECOMMENDED FOR CONSULTATION.

- Mammata : Kavyaprakasa.
- Dhananjaya : Dasarupaka.
- Courthope : Life in Poetry and Law in Taste.
- Saintsbury : History of Literary Criticism.

#### Branch IV.

#### Sanskrit Language and Literature, 1944 and 1945.

General part—Same as for 1943 with the change (1) that Langaksibhaskar's Arthasangraha be replaced by Narayanabhattacharya's Manameyodaya (Paramana portion only).

(2) that Siddhantakaumudi, etc. be replaced by Laghupaniniya (complete.)

(3) that Vidyanatha's Prataparudriya be replaced by Visvanatha's Sahityadarpana (omitting the Arthalankara portion) and Appayyadiksita's Kuvalayananda.

(4) that Aitareyabrahmana Adhyaya I be deleted.

(5) that Chandogyopanishad Adhyaya III be replaced by the same, Adhyaya

VI.

Special Part—Vyakarana and Sahitya be replaced by Vedanta and Mimamsa. BOOKS RECOMMENDED.

(1) Dharmarajadhavarin : Advaitaparihāsa (Venkateswara Steam Press, Bombay.)

(2) Ramanuja : Vedarthasāgraha (Lazarus and Co., Benares.)

(3) Bhagavadgita : Chapters i to vi, with Bhasya of Sankara Ramanuja and Madva.

(4) Sankaracarya : Brahmasutrabhasya, Catuhsutri only (Nirnayasagara Press, Bombay).

Apodeva : Mimamsanyayaprakasa (Chowkamba Book Depot, Benares).

#### Branch IV.

### Sanskrit Language and Literature—1946.

Same as for 1945.

#### Branch V.

### Malayalam Language and Literature.

#### SYLLABUS.

History of the Malayalam Language.

(Common to B. A. Part III. Group iii b, also.)

INTRODUCTORY.—The origin and meaning of the word Malayalam. The place of Malayalam in the Dravidian family of languages. Its age and the geographical area where it has been spoken. Kotuntamil and Sentamil. Kerala and its peculiar geographical position which brought about the development of Malayalam as a separate language. Other causes of this development. The beginning of the cultivation of Malayalam as a literary language. Earliest available works such as Ramacharitam, and their importance in regard to the historical study of the language.

II. The periods of Malayalam language. Ancient and modern characteristics of the language. Illustrative literature of each period, and the difference they exhibit in point of grammar and vocabulary.

III. Earliest Malayalam grammar. Lilatilakam ; its importance as regards the historical study of Malayalam. The extent of the influence of Sentamil on that work.

IV. Language and dialect. The standard of literary language and the spoken language. Their relation and mutual influence. Their reason and extent of the influence of Sanskrit on Malayalam grammar and vocabulary. How Malayalam dialects are formed. Whether dialects are discernible in old Malayalam literary works.

V. Alphabet. (a) Script. Vattezhuttu and the grantha Tamil Characters; their geographical distribution, origin and history. How the Arya-ezhuttu gradually developed. Its connection with the introduction of Sanskrit words. The long e and o. Malayazhma and Kolezhuttu.

(b) Sound values. How far the alphabet is phonetic. Its pronunciation. The spoken words and the written symbols. Causes of the differences in pronunciation and spelling in modern Malayalam. Spelling reform.

VI. Phonology. Vowels and their relation to the primitive Dravidian vowel-system. Classification of vowels according to the place of production. History of vowel sound. Samvrta 'u'. Diphthongs. Vowel sandhi. Consonants and their relation to primitive Dravidian consonants. Classification of consonants according



to the place of production. History of consonantal sounds. Consonantal sandhi. Rules of syllabation in Malayalam, and the light thrown by them on the nature of loan words. Formation of conjunct consonants.

VII. Accidence. (a) Nouns. Nominal bases and their peculiarities in Malayalam. GENDER. Prefixes and suffixes. Poetical gender based on Sanskrit usage. NUMBER. Rules of pluralisation. Double plurals Epicene and honorific plurals. CASE. The number of cases and Sanskrit influence. The formation of the oblique cases. The inflectional base. Inflectional increments or augments, their varied uses and probable origin and history. The uses of the various cases. Gatis and metaplastic forms.

(b) Pronouns. Personal, demonstrative and interrogative. The chief differences between Malayalam and Tamil in the use of demonstratives. The use of 'tan'. Honorific pronouns.

(c) Verbs. (1) Structure. The base. Bases with no direct counterparts in Tamil. Old Malayalam bases which are not found in new Malayalam. Formative particles added to roots. Classification of primitive roots according to (i) form—strong and weak; and (ii) sense—transitive, intransitive, reflexive, and those which have no agent in the nominative case. Classification of secondary roots. Transitive verbs. Casual verbs. Demonstrative verbs. Frequentative verbs.

(2) TENSES. Suffixes and personal terminations; their origin and history.

(3) MOODS, etc. How the imperative, infinitive, optative and potential moods are formed. VOICES. Devices for expressing the idea of the passive voice. The history of 'petu'. Negative verbs. The growing disuse of the negative tenses. Infinitive verbs. Verbal nouns and nouns of agency. Participles qualifying nouns as adjectives. Participles modifying verbs as adverbs.

VIII. Vocabulary. General character of the Malayalam vocabulary at different periods. Indigenous words. How far the vocabulary of Tamil and Malayalam is common. Tat-amasa and Tabdhava, and the causes of the origin of the latter. Periods and purposes of borrowing. Hybrids. Loss of old words; its nature and extent.

IX. Word-building. (1) Composition. Several kinds of compounds. (2) Derivation. The various suffixes used to form nouns, verbs, adjectives and adverbs. (3) Root-creation.

X. Semantics. Changes in meaning and usage. Elevation, degradation, specialisation, and generalisation of Dravidian and other words.

XI. Syntax. Order of words in a sentence. The difference between prose and poetry as regards syntax. Deviations from the normal order of words in a sentence and their causes. Sanskrit constructions in Malayalam.

#### LITERARY CRITICISM.

I. Introductory. The definition and the scope of literature. The impulses behind literature. The themes of literature. The object of literature. The classification of literature. The elements of literature.

II. Introductory continued. Literature as an expression of personality. The study of an author. Chronological and comparative methods. How far biography is useful in the study of literature. The historical study of literature. Literature as the product of society. The inter-action of races and epochs in the evolution of literature.

III. Introductory continued. The historical study of style. The study of literary technique.

IV. \*The history of literary criticism. Western methods. The contributions of Aristotle, Horace, Longinus and Dante to criticism. Position of criticism at the Renaissance.

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\*Only an elementary knowledge of western methods is expected.

V. Western methods continued. The neo-classic creed. The contributions of Dryden, Addison, Johnson and Voltaire.

VI. Western methods continued. The dissolvents of neoclassicism. The establishment of romanticism. The contributions of Lessing, Wordsworth, Coleridge, Hazlitt, Sainte Beuve and Goethe.

VII. Western methods continued. The contributions of Matthew Arnold, Walter Pater and John Addington Symonds. Realism in literature. The present state of criticism in Europe.

VIII. The history of literary criticism. Indian methods. The theory of *rasa* (aesthetic pleasure). Its exposition by Bharata. The eight *rasas*, the eight *sthyibhavas* (permanent moods), the thirty-three *vyabhi-charibhavas* (inconstant moods) and the eight *Satvikabhavas* (evidences of internal feeling). The *alamkara* system as expounded by Bhānava, Udbhata and Rudrata. The *riti* system of Dandin and Vāmana.

IX. Indian methods continued:—The theory of *dhvani* (suggestiveness) as expounded by Anandavardhana and Abhinavagupta. Its relation to *sphota* and *rasa*. Criticism of Lollata's theory of *utpatti* (causation), Sankuka's and Mahimabhatta's theory of *anumana* (inference) and Bhattanayaka's theory of *bhoga* (enjoyment). The incompleteness of Kuntala's theory of *vakrokti* (artistic expression) and Kshemendra's theory of *auchitya* (propriety).

X. Indian methods continued. The contributions of Mammata, Visvanatha and Jagannatha to literary criticism. Kavisiksha and Kavisamketa. How far the western and the Indian theories of criticism may be reconciled.

XI. Poetry. The nature of poetry. Rhythm and metre. How far metre is an essential requisite of poetry. Poetry as an interpretation of life. Poetry and science. Poetic truth. The revealing power of poetry. The ultimate standard of greatness in poetry. Poetry and philosophy. The classification of poetry according to western and Indian writers.

XII. The drama and western methods of criticism. The drama and the novel. Dependence of the drama on conditions of stage representation. Tragedies and comedies. Plot. Characterisation. Dialogue. The natural divisions of a dramatic plot. Dramatic design.

XIII. The drama and Indian methods of criticism. The ten varieties of Sanskrit dramas. Subject matter—substantive and accessory. Pro-episode. The object of the drama. The five requisites of the object and the five stages of enterprise. The five *sandhis* (articulations). *Dramatis personae* and their characteristics. Comparison of the western and Indian systems of criticism.

XIV. The novel. Plot. Characterisation. Dialogue. Classification of novels. The short story.

XV. The Essay. Epistolary and other minor forms of prose-literature.

XVI. The use and abuse of criticism. Inductive and judicial criticism. The problem of the valuation of literature.

XVII. The influence of Sanskrit criticism on Malayalam literature till recently. The influence of western criticism, of late. The influence of English, Bengali, Hindi and Persian literatures on modern writers. Mystic and realistic literature. The progress of literary criticism in Kerala.

#### HISTORY OF KERALA FROM ORIGINAL SOURCES AND INSCRIPTIONS.

I. Sources of the history of Kerala (1) Legendary, (2) literary (3) epigraphic (4) and numismatic. Their relative value.

II. The people. Namputiris. The *parasurama* legend. How far *Keralamahatmyam* and *Keralatpatti* are reliable. Nayers. The *Marumakkattayam* system of inheritance. The *Kalari* system of military training. *Izhavas*. Other important communities.

III. Vestiges of Jainism and Buddhism in Kerala.



II. Introductory continued: Division of the subject. Syntax. Morphology. Phonology. Semantics. Linguistic Palaeontology.

III. Sounds. The organ of speech. The production, classification and reception of speech sounds.

IV. Sounds continued. Phonetic laws and tendencies. Phonetic changes. Metathesis. Prothesis. Epenthesis. Anaptyxis. Haplology. Assimilation. Dissimilation. Accent pitch and stress. Vowel gradation. Application of phonology to etymology.

V. Writing. Origin and development of writing. Picture ideographic and phonetic writing. Homophony and polyphony. Syllabism and Alphabets. Spelling.

VI. Grammar. Semantemes and morphemes. Three types of sentences. Roots and their derivative forms. The various kinds of affixes. Prefixes and suffixes. Compound words.

VII. Grammar continued. Grammatical categories. Gender, number, tense, voice. Relativity of grammatical categories. Logical and psychological classification of the 'parts of speech'.

VIII. Grammar continued. The 'general nature of morphological evolution. Tendencies towards uniformity and expressiveness. The working and effect of analogy. Contamination.

IX. Semantics. The nature and extent of vocabularies. Particular and immediate value of words as spoken. Arrangement of words in the mind. Word symbolism.

X. Semantics continued. Changes of meaning in borrowed words. Changes of meaning in cognate languages. Expansion, contraction and transference of meaning. Reasons for changes of meaning. Coining of new words.

XI. Structure of languages. The variety of languages. Growth of languages. Physical, racial, mental and cultural influence. Dialect, special language and slang. Standard language. Inter-relations of common language and their dialects. Languages contacts. How languages die out. Mixed languages and the conditions in which they are built up.

XII. Linguistic palaeontology. The method of linguistic palaeontology. The precautions to be observed.

XIII. Classification of languages. Syntactical and genealogical classification of languages. Division of languages. (1) inorganic and (2) organic. Sub-divisions of the organic type (1) incorporating languages (2) agglutinating languages and (3) inflecting languages. Family characteristics of languages.

XIV. Classification of languages continued. Distribution of Indian languages.

## ELEMENTS OF THE COMPARATIVE GRAMMAR OF DRAVIDIAN LANGUAGES.

(Common to B. A. Part III Group iii—b also.)

Introductory. The Dravidian family of languages. Their chief characteristics. Reasons for choosing the word 'Dravidian' as the name of this family. Theory about scythian origin untenable. Theories about the original home of the Dravidian speaking people. Primitive Dravidian Language.

II. Introductory continued—Enumeration of Dravidian languages. Cultivated languages and uncultivated dialects. Meaning of the names Tamil, Telugu, Kanarese and Malayalam. Where they are spoken and when their literature commenced.

III. Introductory continued. Relation between Dravidian languages and Sanskrit. Dravidian element in Vedic Sanskrit and in the spoken languages of North India. Earliest extent written relics of the Dravidian languages.

IV. Dravidian alphabets. Their origin and history. Differences among existing alphabets. How far these alphabets are adequate.

V. Dravidian phonology, Vowel system. Changes. Harmonic sequence of vowels. System of consonants. The law of convertibility of surds and sonants. Theories about the origin of cerebrals. Dialectic interchange of consonants. Epiphonic nasalisation. Prevention of hiatus. Dravidian syllabation. Minor dialectic peculiarities.

VI. Dravidian roots. Two classes of roots. Reduplication of the final consonant of roots. Particles of specialisation. Changes in root-vowels.

VII. Accent. (1) Nouns. (a) Gender. Dravidian nouns divide into two classes denoting rational beings and irrational things, except in Telugu. Primitive laws of gender faithfully followed in Malayalam. Comparison between Dravidian languages on the one hand and Sanskrit and English on the other.

(b) Number. Only singular and plural. Masculine, feminine, and neuter singulars. Principles of pluralisation.

(c) Case. Principles of case-formation, Dravidian cases.

(2) Adjectives. The agreement of adjectives with substantives. Formation of Dravidian adjectives from Sanskrit derivatives. Formation of adjectives from substantives, relative principles, and past participles, Comparison of adjectives.

(3) Numerals. Different views about their origin. The cardinals and ordinals. The neuter noun of number and the numerical adjective.

(4) Pronouns. Pronouns of the first and second person singular. Comparison of dialects. Reflexive pronoun. Pluralisation of personal and reflective pronouns. Demonstrative and interrogative pronouns. Demonstrative and interrogative cases. Demonstrative and interrogative adjectives and adverbs. Honorific demonstrative pronouns.

(5) Verbs. Structure of the Dravidian verbs. Many roots used either as verbs or nouns. Formative particles often added to roots. Classification of verbs into transitive and intransitive. Ways in which intransitive verbs change into transitive. Sanskrit analogies.

(a) Causative verbs. Causals formed from transitives. Origin of the Dravidian causal particles.

(b) Frequentative verbs,

(c) Conjugational system. Formation of tenses. Verbal participles, their signification and force. The present tense and its formation. The preterite tense and its formation. The future tense and its formation. The relative participle.

(d) Mood. Methods of forming the conditional, the imperative and the infinitive moods. Origin of the infinitive affix.

(e) Voice. Active and passive voices. The negative voice. Combination of negative particles with verbal themes. The Dravidian negative participle.

(f) Formation of verbal nouns, derivative nouns and abstract nouns.

(6) Adverbs.

VIII. Vocabulary. Borrowing and its causes. Social, religious, commercial and political. Borrowings from Sanskrit. Borrowings from other languages.

IX. Syntax. The syntax of the several languages compared. Similarities and differences. Extent of the influence of Sanskrit over the syntax of the several languages.

## BRANCH V.

## MALAYALAM LANGUAGE AND LITERATURE.

1948.

## Text Books—General.

## I. POETRY :—

1. Ramacaritam, first twenty-five patalams.
2. Kannassabharatam, Part I.
3. Unnihilisandesam.
4. Girijakalyanam—Unnayi Variyar.
5. Mahabharatam, Bhisma Parvam—Thuncattu Ezhuttacchan.
6. Kirmiravadham Kathakali—
7. Kesaviyam, first three cantos—Kesava Pillai, K. C.
8. Sahityananjari, Part V—Narayana Menon, Vallattol.
9. Nalini—Kumaran Asau, N.

## \* DRAMA :—

1. Malatinadhavam by Kottarattil Sankunni.
2. Uttararamacharitam—

## PROSE :—

1. Brahmandapuramam Gadyam.
2. Tuncattu Ezhuttacchan—Narayana Pillai, P. K.
3. Sahityaprasangamala—Anantan Pillai, P.
4. Dharmaraja—Raman Pillai, C. V.
5. Vijnanadipika, Vol. III—Parameswara Aiyar, Ullur, S.

## II. SPECIAL SUBJECT—CAMPUS :—

1. Ramayanacampu, Sundarakandam (whole).
2. Bhashanaishadhacampu, Part I.
3. Bakavadhacampu, published by the Malayalam Improvement Committee, Cochin.
4. Ushakalyanam Campu—Changanasery Ravi Varma Koyiltampuran.

## III. GRAMMAR, PROSODY AND POETICS :—

1. Lilatilakam.
2. Keralapaniniyam, Rajaraja Varma, A. R.
3. Vrttamanjari, Do.
4. Bhasabhushanam, Do.
5. Dravidavrttangalum Avayute Dasaparinamangalum—Appan Tampuran.
6. Sahityadarpanam, published by the Malayalam improvement Committee, Cochin.
7. Bhashadarpanam—Krishna Pisharoti, A.
8. Natakapravesika—Hari Sarma, A. D.
9. Rupamanjari by A. Balakrishna Pillai, B. A., B. L., Kamalalaya Book Depot, Trivandrum.

## BOOKS RECOMMENDED FOR CONSULTATION :—

1. Manidipika—Rajaraja Varma, A. R.
2. Prayogadipika—Narayana Pillai, P. K.
3. Malayalam Grammar—Gundert.
4. Malayalam Grammar—Paccu Muttatu.
5. Vyakaranamitram—Seshagiri Prabhu, M.
6. Kerala Kaumudi by Kovunni Netungati.

## IV. HISTORY OF LANGUAGE AND PHILOLOGY :—

1. Language, A Linguistic Introduction to History—Vendryes.
2. A Comparative Grammar of the Dravidian Languages—Caldwell.
3. Linguistic Survey of India, Vol. IV, the Dravidian Languages—Grierson.

4. Grammar in Lilatilakam—Ramaswami Aiyar, L. V.
5. A Critical Study of Malayalam Language and Literature—Krishna Pisharoti, A.
6. Arya-dravidabhashakalute parasparasa mbandham—Ravi Varma, L. A.

**Books RECOMMENDED FOR CONSULTATION :—**

1. Language, its Origin, Theory and Development—Jespersen.
2. The History of Language—Sweet.
3. Introduction to the Study of Language—Bloomfield.
4. Introduction to the Science of Language—Sayce, A. H.
5. Origin and Development of the Bengali Language, introduction—Chatterji, S. K.
6. Dravidic Studies, Nos. 1-4, published by the Madras University.
7. History of Kannada Language—Narasimhacharya, R.
8. Introduction to Comparative Philology—Gune.
9. Studies in Dravidian Philology—Ramakrishnaia, K.
10. Morphology of Malayalam by Ramaswami Aiyar, L. V.

**V. HISTORY OF LITERATURE AND LITERARY CRITICISM:—**

1. Malayalabhashacaritram, Vols. I & II—Govinda Pillai, P.
2. Keralabhashasahityacaritram—Narayana Panikkar, R.
3. Sahityacaritam, Vol. I—Krishna Pisharoti, A.
4. Sahityalocanam—Sankaran Nampiyar, P. M.
5. Vijnanadiipika, Vol. IV—Ullur S. Parameswara Aiyar.
6. Navinanatakadarsam by Mekkolayil Parameswaran Pillai, B. A.
7. Kathakali by G. Krishna Pillai, Mavelikara.

**Books RECOMMENDED FOR CONSULTATION :—**

1. Introduction to the study of English Literature—Hudson.
2. Literary Criticism—Lacelles Abercrombie.
3. Principles of Criticism—Worsfold.
4. Sanskrit Poetics, Vols. I and II—De, S. K.
5. Upanyasamanjari—Sankaran Nampiyar, P.
6. Sahityapraivesika—Kunjan Pillai, Suranad, P. N.
7. Prachinakeralalipikal—Ravi Varma L. A.—published by the Malayalam Improvement Committee, Cochin.
8. Kavyajivita-vrtti, Vols. I and II—Krishnan Nayar, P.—published by the Madras University.
9. Vijnanadiipika Vols. 1 to 11.

**VI. HISTORY OF KERALA (up to 1798 A. D., from Original Sources).**

(The following books are recommended for the History of Kerala to indicate the scope of the subject.)

1. The Relations of Geography and History—George, H. B.
2. The Geography of Ancient India—Cunningham, A.
3. The Student's Manual of Ancient Geography—Bevan, W. L.
4. The Geography of Travancore—Foulkes.
5. Cambridge History of India, Vol. I, Chapters 24 and 25.
6. Ancient History of India—Smith, V. A.
7. Ancient India—Dutt, R. C.
8. The Beginnings of South Indian History—Krishnaswami Aiyangar, S.
9. Tamil's Eighteen hundred Years Ago—Kanakasabhai Pillai.
10. History of the Tamils—Srinivasa Aiyangar, P. T.
11. Chronology of the Early Tamils—Sivaraja Pillai, K. N.
12. The Cera kings of the Sangam Age—Sesha Aiyar, K. G.
13. Tamil Studies—Srinivasa Aiyangar, M.
14. Maimekhalai in its historical setting—Krishnaswami Aiyangar, S.
15. Dravidian India—Sesha Aiyangar, T. R.
16. The Pandyan Kingdom—Nilakantha Sastri, K. A.
17. Prachinakeralam—Balakrishna Variyar, M. R.

18. Keralacaritam—Krishna Pisharoti, A.
19. Keralotpatti.
20. Keralamahatmyam.
21. Ancient India as described by Ptolemy—Mc. Crindle, J. W.
22. The Periplus—Mc. Crindle, J. W.
23. Marco Polo, edited by Yule.
24. Travels of Ibn Batuta—translated by Lee.
25. The Land of the Perumals—Francis Day.
26. Description of the Sea-ports of Malabar—Edge.
27. Manners and Customs of the People of India—Abbe DuBois.
28. Memoirs of Travancore—Horsely.
29. Historical Notices of Cochin—Whitehouse.
30. Malabar Law and Custom—Wigram.
31. Native Life in Travancore—Mateer, S.
32. Life and Letters of St. Francis Xavier—Coleridge.
33. Christian Researches in Asia—Buchanan, Claudius, A. D.
34. History of the Malabar Church—Geddes.
35. The Syrian Church in Malabar—Panjikkaran, J. C.
36. Church History of Travancore—Augur, C. M.
37. Keralapazhama.
38. Malabar and the Portuguese—Panikkar, K. M.
39. Malabar and the Dutch Do.
40. Some Early Sovereigns of Travancore—Sundaram Pillai, P.
41. Travancore Archaeological Series, Vols. I to VII.
42. Travancore State Manual—Nagam Aiya, V.
43. Cochin State Manual—Acyuta Menon, C.
44. Malabar Gazetteer.
45. History of Kerala Vols. I to IV—Padmanabha Menon, K. P.
46. History of Travancore—Sankunni Menon, P.
47. History of Travancore—Narayana Panikkar, R.
48. Kerala Society Papers.
49. History of Cochin, Vols. I and II—Padmanabha Menon, K. P.

#### INSCRIPTIONS.

The following list of inscriptions is provisionally recommended for study in relation to the History of Kerala.

(Attention should be particularly devoted to the historical portions of the inscriptions).

1. The Larger Cinnamanur plates—South Indian Inscriptions, Vol. III, Part IV.
2. Inscriptions of Bhaskara Ravivarman, A. B. and C only Travancore Archaeological Series, Vol. II, pp. 31-37.
3. Inscriptions of Sthanu Ravi (first two only). T. A. S. Vol. II, pp. 60-85.
4. Trivandrum Museum Stone Inscription of Marancatayan T. A. S. Vol. I. No. 7, pp. 153-159.
5. Huzur office Plates of Ko-Karunandtatekkan (first two only)—T. A. S. Vol. I. No. 1, pp. 1-14.
6. Paliyam plates of Vikramaditya Varaguna T. A. S. Vol. I. pp. 187-193.
7. Two inscriptions of Srivallabhan Kotai. (T. A. S. Vol. IV pp. 1-11).
8. Colapuram inscription of Virakeralavarman T.A.S. Vol. IV, p. 17.
9. Kanyakumari inscription of Virarajendracola Epigraphia Indica, Vol. 18, No. 4.
10. Kanyakumari inscription of Parantakapandya. T. A. S. Vol. I, No. 3, pp. 1-7.
11. Vellayani inscription of Viraramavarman. T. A. S. Vol. III, pp. 33-36.
12. Kilimanur record of Kollam 843, T. A. S. Vol. V. pp. 63-92,



13. Colapuram records of Sundarapandyadeva and Kulottungacoladeva. T. A. S. Vol. VI, pp. 1-20.
14. Three inscriptions of Viraravivarman (first two only) T. A. S. Vol. I, No. 10, pp. 175-178.
15. Paliyam plates of the 322nd year of the Putavaippu Era T. A. S. Vol. I, No. 4, pp. 1-12.

VII. Sanskrit.

1. Uttaramacarita—Bhavabhuti.
  2. Dutavakkyam (ദുതവക്യം) by Narayana Bhattatiri.
  3. Harashacarita—III Uchhvasa only—Bana.
- A knowledge of the Elements of Sanskrit Grammar will also be required.

Branch V.

MALAYALAM LANGUAGE AND LITERATURE.

1944 and 1945.

Same as for 1943 with the change that in Sanskrit as a related language Harshacarita, third uchhvasa be replaced by Harshacaritasangraha (whole.)

Branch V.

MALAYALAM LANGUAGE AND LITERATURE.

1946.

I. General-Texts.

- POETRY : (1) Ramacaritham—Patalams 1—25.  
 (2) Kannassaramayanam—Balakandam.  
 (3) Mahabharatam—Bhismaparvam.  
 (4) Unninishandesam.  
 (5) Girijakalyanam.  
 (6) Kirmitravadhnam Kathakali by Kottayathu Thampuran.  
 (7) Naisadham (Translation) by Puliur Purushothaman Nambudiri, Sargas 1 and 2.  
 (8) Sahityamanjari by Vallathol Part IV.  
 (9) Prarodanam by Kumaran Asan.
- DRAMA : (1) Janakiparinayam by Chattukkutti Mannadiyar.  
 (2) Malatimadhavam by Kottarathil Sankunni.
- PROSE : (1) Kautiliyam—Part II.  
 (2) Tuncattu Eluthacchan by P. K. Narayana Pillay.  
 (3) Rajarajiyam by Balakrishna Pillai.  
 (4) Dharmaraja by C. V. Raman Pillay.  
 (5) Vijnanadipika Part IV by Mahakavi Ullur S. Parameswara Aiyar.

II. Special subject—Campus.

- (1) Ramayana Campu—Balakandam.
- (2) Rajaratnavaliyam Campu.
- (3) Usakalyanam Campu.
- (4) Champukavyas by Mahakavi Ullur S. Parameswara Aiyar.

III. Grammar, Prosody and Poetics—Same as for 1945.

IV. History of Language and Philology—Same as for 1945.

V. History of Literature and Literary Criticism—Same as for 1945.

VI. History of Kerala—Same as for 1945 with the change that under books recommended for consultation omit Nos. 2, 3, 4, 6, 7, 9, 14, 27, 28, 31, 40 and 47.

VII. Sanskrit.

1. Uttaramacarita—Bhavabhuti.
  2. Sukasandesa.
  3. Harashacaritasangraha (whole).
- A knowledge of the Elements of Sanskrit Grammar will also be required.

## B. Sc. (Hons.) DEGREE EXAMINATION.

## BRANCH I—MATHEMATICS.

## DETAILED SYLLABUS.

## (1) GEOMETRY.

Including Pure Geometry and Analytical Geometry of two and three Dimensions :—

## (a) GEOMETRY OF TWO DIMENSIONS.

The material properties of the point, the straight line, the circle, the parabola, the ellipse and the hyperbola treated by pure geometric methods, by means of Cartesian co-ordinates, polar co-ordinates and homogeneous co-ordinates chiefly areal and trilinear.

Cross Ratios, Harmonic Section. Involution ranges and pencils. Perspective Principle of duality. Reciprocation with respect to conics. Line Co-ordinates, application of tangential equations to conics. The method of projection, considered from the pure geometric point of view, its analytic basis. The principle of continuity, imaginary points and lines. Projective properties of conics. Simple geometric applications of invariants of conics.

## (b) GEOMETRY OF THREE DIMENSIONS.

The line, the plane and the regular solids treated by pure geometrical methods.

ANALYTICAL GEOMETRY OF THREE DIMENSIONS WITH CARTESIAN CO-ORDINATES.—The Straightline, the Plane, the Sphere, the Cone, the Quadrics, their plane sections and generating lines. Confocal Quadrics. The reduction of the general equation of the second degree.

## A. BOOKS FOR STUDY—

1. Askwith : Pure Geometry.
2. W. P. Milne : Projective Geometry.
3. Smith : Conic Sections.
4. Askwith : Analytical Geometry of the Conic Sections.
5. C. Smith : Solid Geometry.
6. R. J. T. Bell : Co-ordinate Geometry of three Dimensions.
7. Hall and Stevens : School Geometry, Part VI.
8. Nixon : Geometry in space.

## B. BOOKS FOR REFERENCE—

1. C. V. Durell : Plane Geometry for Advanced Students.
2. J. W. Russell : Pure Geometry.
3. Milne : Homogeneous Co-ordinates.
4. Salmon : Conic Sections.
5. Frost : Solid Geometry.

## (2) ALGEBRA AND THEORY OF EQUATION.

Inequalities and Limits. Convergence and divergence of Series and of Infinite Products. Binomial and Exponential Theorems. Logarithmic series. Summation of series. Continued fractions, simple and recurring. Indeterminate equations. Theory of numbers. Elementary proportions in Probability. (Standard as in C. Smith's Algebra).

THEORY OF EQUATIONS. Relations between the roots and co-efficients. Symmetric functions of the roots, transformation of equations : binomial and reciprocal equations ; properties of derived functions. Rolle's theorem. Location of the roots. Sturm theorem. Algebraical solution of cubic and biquadratic equations ; solution of numerical equations. Horner's method. Graphical solution of equations. Determinants and Elementation. (Standard as in Burnside and Panton).

MATRICES. The laws of addition and multiplication. Transposed, Reciprocal and Adjoint Matrices. The three elementary processes with Matrices. Rank. Reduction of a non-singular Matrix to the Canonical form ; Applications ; Linear Transformations and the reduction of the general quadratic form.

**FINITE DIFFERENCES.** The Symbols and the operational methods and relations between them. Applications to summation of series. Simple Difference Equations with constant coefficients.

### (3) PLANE TRIGONOMETRY.

Fuller treatment of the B. A. Course. Properties of Triangles and quadrilaterals. Complex Numbers. De Moivre's Theorem and Applications. Factorisation; Infinite series, convergence of complex series. The power series. Trigonometrical expansions. Determination of  $\pi$ . Summation of Series. Elementary properties of hyperbolic functions. Convergence of infinite Products. Expressions for the sine and cosine as infinite products.

(Standard as in Loney's Trigonometry and treatment as Hobson's Plane Trigonometry.)

### (4) MATHEMATICAL ANALYSIS.

INCLUDING THE DIFFERENTIAL AND INTEGRAL CALCULUS AND DIFFERENTIAL EQUATIONS.

#### 1. PRELIMINARY.

Irrational numbers, simple notions as to their genesis obtained from the intuitive properties of the straight line. The linear continuum. Infinite sequences, limiting points, upper and lower limits. General principle of convergence. General idea of a function of a real variable, the elementary functions and their graphical treatment. Limits of functions of a continuous variable, continuity of functions, properties of continuous functions. Inverse functions, proof of existence when original function is steadily increasing or decreasing.

#### 2. DIFFERENTIAL AND INTEGRAL CALCULUS.

Functions of one real variable. Derivatives, general theorems and rules for differentiation, repeated differentiation, Leibnitz's theorem, general theorems concerning derivatives. Rolle's theorem, mean value theorem. Geometrical applications of derivatives. Integration as the operation inverse to differentiation, standard forms and processes of integration. The general mean value theorem of the differential calculus, applications to maxima and minima, to evaluation of limits, and to contact of plane curves. Envelopes, Curvature. Taylor's series, convergence of the standard Taylor series. Integration of bounded functions according to Riemann, integrability of continuous functions and monotonic functions, the fundamental theorem of the integral calculus. The first and second mean value theorems of the integral calculus. Functions defined by definite integrals, their continuity, differentiation and integration. Applications of definite integrals.

Functions of several real variables, continuity. Implicit functions, idea of their existence (without proof). Partial derivatives, differentiation of implicit functions and composite functions. Euler's theorem on homogeneous functions. Taylor's theorem for functions of several variables, simple applications to maxima and minima, and to the finding of singular points and asymptotes of algebraic curves. Double integrals, line integrals, surface, integrals, and tripple integrals—evaluation in simple cases. Green's theorem. Geometric applications of multiple integrals.

Simple instance of functions of a complex variable. Cauchy's theorem (proof by use of Green's theorem).

#### 3. INFINITE SERIES AND INFINITE INTEGRALS.

Series of positive terms. Simpler tests of convergence. Series of positive and negative terms, Abel's and Dirichlet's tests. Absolute convergence, effect of change of order of terms on sum. Absolutely convergent double series. Multiplication of absolutely convergent series.

Series of variable terms. Uniform convergence, Weierstrass's M-test, chief properties of uniformly convergent series as regards continuity, differentiation and integration. Fundamental properties of power series, standard power series. Fourier series of bounded functions with a finite number of maxima and minima and a finite number of discontinuities. Infinite products, the standard infinite products.

Infinite integrals. Functions defined by infinite integrals. Uniformly convergent integrals, their continuity, sufficient conditions for differentiating and integrating under the sign of integration, simple applications to the evaluation of infinite integrals.

#### 4. DIFFERENTIAL EQUATIONS.

##### (A) ORDINARY DIFFERENTIAL EQUATIONS INVOLVING TWO VARIABLES.—

Formation of differential equations, character of solutions, geometrical meaning of differential equations.

EQUATIONS OF FIRST ORDER. Variables separable, linear equation. Bernoulli's equation, homogeneous equation, one variable absent,  $Mdx - Ndy = 0$ , integrating factors and their discovery in the simpler cases. Equations of  $n$ th degree that can be resolved into component equations of first degree, equations solvable for  $x$  or for  $y$ , Clairaut's form. Singular solutions, the  $p$ - and  $c$ - $\Delta$  discriminants, geometric interpretation.

Linear equations with constant co-efficients; Euler's linear equations. Exact equations.

$$\text{The equation } y^{(n)} = f(x), y^{(n)} = f(y), y^{(n)} = \int \{ y^{(n-1)} \}, y^{(n)} = \int \{ y^{(n-2)} \};$$

Depression of order when one variable is absent.

EQUATIONS OF SECOND ORDER.—The complete solution in terms of known integral relation between integrals.

Geometric applications; finding of curves with given properties; trajectories.

##### (B) ORDINARY DIFFERENTIAL EQUATIONS INVOLVING MORE THAN TWO VARIABLES :

Simultaneous linear differential equations, the equation  $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$  and its geometrical interpretation. Total differential equations (with three variables), the condition of integrability, geometric interpretation of the equation and its solution.

##### (C) PARTIAL DIFFERENTIAL EQUATIONS :

Their derivation, classification of integrals of a partial differential equation, geometric interpretation. Lagrange's equation  $Pp + Qq = R$ , Charpit's method. The standard forms  $\psi(p, q) = 0$ ,  $\psi(z, p, q) = 0$ ,  $\partial'(x, p) = \psi(y, q)$  and  $z = px + qy + \theta(p, q)$ .

STANDARD AS IN THE FOLLOWING BOOKS :

1. H. Lamp : Infinitesimal Calculus.
2. Gibson : Elementary Treatise on the Calculus.
3. Murray : Introductory Course in Differential Equations.
4. Carslaw : Fourier Series, Part I.
5. Edwards : Differential Calculus.

BOOKS FOR REFERENCE

1. G. H. Hardy : Pure Mathematics.
2. Goursat-Hedrick : Mathematical Analysis. Vol. I.
3. Wilson : Advanced Calculus.
4. Chrystal : Algebra, Vol. II.
5. Bromwich : Infinite Series.
6. Forsyth : Treatise on Differential Equations.
7. Williamson : Differential Calculus and Integral Calculus.
8. Piaggio : Differential Equations.

## (5) DYNAMICS OF A PARTICLE.

## PRELIMINARY.

Velocity and acceleration, relative motion, angular velocity, laws of motion, impulsive forces, units.

## RECTILINEAR MOTION.

Equations of motion, simple harmonic motion, constant disturbing force, periodic disturbing force, damped and forced oscillations, various laws of resistance.

## MOTION IN TWO DIMENSIONS.

(1) CARTESIAN CO-ORDINATES. Composition of simple harmonic motions, motion of a projectile in vacuum, in a resisting medium, different laws of resistance. Equation to energy. Rotation axes.

(2) POLAR CO-ORDINATES. Velocity and acceleration in polar co-ordinates. Central forces; differential equation of orbit, orbits for various laws of force. Disturbed circular orbit; apsides. Law of the inverse square; construction of orbit. hodograph, time of describing an arc. Kepler's law, correction to 3rd law; perturbations.

(3) CONSTRAINED MOTION. Tangential and normal accelerations. Motion on a fixed smooth or rough curve. Motion on a smooth or rough cycloid, motion in a circle, time of describing an arc, series for time of oscillation; small oscillations of simple pendulum under resistance proportional to square of velocity. Motion on a revolving curve; motion of a particle in a revolving tube.

(4) MOTION OF TWO OR MORE PARTICLES. Principles of conservation of energy and of angular momentum. Two particles connected by a string passing over a pulley. Impulses, motion of a chain.

## (6) DYNAMICS OF A RIGID BODY.

Moments and products of inertia; momental ellipsoid, momental ellipse, equi-momental systems. Principal axes. D'Alembert's principle, general equations of motion. Independence of translation and rotation. Impulsive forces.

MOTION ABOUT A FIXED AXIS. Fundamental theorem. The compound pendulum, centre of oscillation. Torsional oscillations, bifilar suspension. Pressures on the fixed axis for bodies. symmetrical and not symmetrical. The ballistic pendulum. Impulsive forces, centre of percussion.

MOTION IN TWO DIMENSIONS. Finite forces. General principles of conservation of energy and of linear and angular momentum. Systems with one degree of freedom, oscillations about equilibrium. Impulsive forces, impact of a rotating sphere on the ground. Lagrange's equations, systems of two degrees of freedom, double pendulum, oscillations about equilibrium.

## STANDARD AS IN THE FOLLOWING BOOKS :

Lamb's Dynamics.  
Loney's Dynamics.  
Besant and Ramsay's Dynamics.

## BOOKS FOR REFERENCE :

Love's Theoretical Mechanics.  
Routh's Dynamics of a Particle.  
Tait and Steel's Dynamics.  
Routh's Elementary Rigid Dynamics.

## (7) STATICS.

FORCES AT A POINT.—Parallelogram of forces. Parallelopiped of forces. Geometric and analytical reduction of forces acting at a point. Conditions of equilibrium of such forces. Friction. Equilibrium of a particle on smooth and rough curves and surfaces.

**FORCES IN ONE PLANE.** Parallel forces. Theory of moments of forces and of couples; reduction of coplanar forces and conditions of equilibrium of such forces. Actions at smooth and rough hinges and joints. Principle of virtual work as applied to coplanar forces. Astatic equilibrium.

**GRAPHICAL STATICS.** CENTRES OF GRAVITY OF ARC, plane area, surface, and solid. Stable and unstable equilibrium. Machines with and without friction.

**FORCES IN THREE DIMENSIONS ACTING ON A RIGID BODY.** Reduction of such forces to a force and a couple; General conditions of equilibrium; Principle of work applied to any system of forces. Work or Potential function. Stable and unstable equilibrium. Poinso't's central axes; wrench, screw; resultant wrench of two given wrenches. The cylindroid. Reciprocal screws. Reduction of any system to the forces. Conjugate lines, Null lines and Null planes.

**EQUILIBRIUM OF STRINGS.** General conditions of equilibrium of an inextensible string. The common catenary, the parabola of suspension bridge, the catenary of uniform strength; strings on smooth surfaces and curves, strings on rough curves; strings under central forces, extensible string.

**ELEMENTS OF VECTOR ANALYSIS** comprising Gradients, Curls, Scalar and Vector fields.

STANDARD AS IN—

Loney's Statics.

BOOKS FOR REFERENCE :—

Minchin's Statics, Vols. I and II, Chapter XIII—XV.

Routh's Analytical Statics, Vol. I.

## (8) HYDROSTATICS.

Definitions of perfect fluid and pressure at a point. Equality of pressure at a point in all directions, general conditions of equilibrium of a fluid and of a liquid in particular. Fluid at rest under the action of (1) gravity, (2) central forces. Rotating liquid.

Resultant thrusts of fluid on plane areas. Centre of pressure. Thrust of liquid on curved surfaces.

General condition of equilibrium of a floating body. Surfaces of buoyancy and flotation. Positions of equilibrium. Potential energy stored up by the immersion of a solid.

Stable and unstable equilibrium of floating body. Metacentre; expression for metacentric height. Experimental determination of metacentric height; stability of equilibrium (1) of a hollow vessel containing a liquid floating in another liquid; (2) of bodies floating under constraint; (3) of bodies floating in heterogeneous liquid (simple cases only); theory of stability based on the principle of energy.

STANDARD AS IN—

Besant and Ramsay's Hydrostatics, Chapter I—V.

Minchin's Hydrostatics excepting Chapter on Surface tension.

BOOK FOR REFERENCE :—

Greenhill's Hydrostatics.

## (9) ASTRONOMY.

**GENERAL AND ELEMENTARY SPHERICAL.**

The celestial sphere, astronomical co-ordinates.

The diurnal motion of the heavenly bodies and its explanation by rotation of the Earth. Arguments and proofs for the Earth's rotation. Change of phenomena due to a change of the observer's place on the Earth. Form and size of the Earth. Simple problems connected with the diurnal motion solved by using spherical trigonometry.

The apparent motion of the Sun among the stars. Variations in the length of the day at various places. Twilight. Explanation of the phenomena on the supposition of the annual motion of the Earth round the Sun and proofs for this hypothesis. The determination of the first point of Aries and the obliquity of the Ecliptic. The signs of the Zodiac. Effects of Precession and Nutation.

The Earth's orbit round the Sun. Kepler's laws and Newton's deductions therefrom. True anomaly, mean anomaly and the lengths of the different seasons.

Finding by observation the latitude and longitude of a place, and the error of the clock.

Different units of time and the conversion of one into another. Sundial. Equation of time. Different kinds of years. The Calendar.

Corrections of observations for astronomical refraction, parallax and aberration and the fundamental formulæ embodying these corrections. Determination of parallax of heavenly bodies and their distances.

The Moon. Its orbit round the Earth and the Sun. Its rotation and librations. Synodic and Sidereal months. Eclipses and their causes. Ecliptic limits. Number of eclipses in a year. The saros.

Members of the solar system. Elements of a planet's orbit. Direct and retrograde motions of the planets. Phases of the planets. Transits of planets across the Sun. Comets and meteors.

Principal constellations and stars. Double and multiple stars. Binary stars, Nebulæ.

The observatory. The principal instruments—The astronomical clock. Transit instruments. The Transit Theodolite. Equatorial. Sextant. The principal errors of the Transit Instrument and their corrections.

#### TEXT-BOOKS RECOMMENDED FOR STUDY :—

- (1) Barlow and Bryan's Astronomy.
- (2) Young's General Astronomy.
- (3) Ball's Spherical Astronomy (EASIER PARTS).
- (4) Astronomy by Dr. H. Subramanya Ayyar.
- (5) Godfray's Astronomy.

#### BOOKS FOR REFERENCE :—

- (1) Ball's Spherical Astronomy.
- (2) Newcomb's Spherical Astronomy.
- (3) H. S. Jones's General Astronomy.

### (10) ORDINARY LINEAR DIFFERENTIAL EQUATIONS.

(A) ELEMENTARY METHODS OF INTEGRATION. Equations of the first order, standard forms, Bernoulli's and Riccati's equations. Integrating factors. General linear equation of the  $n$ th order and properties, depression of order, adjoint equation. Special forms with constant co-efficients, Euler's equation (only for two variables). Laplace's equation, exact differential equation. The general linear differential equation of the 2nd order; various methods of integration, normal form. Trajectories.

(B) THE THEORY OF LINEAR DIFFERENTIAL EQUATIONS.—Existence theorems. Equation of the first order, system of linear equations of the first order, homogeneous linear equation of the  $n$ th order. First integrals, Jacobi's multipliers. Fundamental systems of integrals, the  $\Delta \neq 0$  criterion. Regular integrals. Study of integrals near a singular point; form and properties, permutation of integrals. The fundamental equation; formal expression of the integrals when all the roots of the fundamental equation are distinct; expression in logarithmic form of the set of integrals corresponding to a repeated root of multiplicity. Fuchs's Theorem on the form of a homogeneous linear equation having all its integrals regular near a singularity, and its converse. Frobenius's method of integration for equations of the 2nd order and application to Legendre's and Bessel's equations and to the equation of the hypergeometric series.

(C) HIGHER METHODS OF INTEGRATION.—Integration by series with simple applications to Legendre's equation, Bessel's equation, and the equation of the hypergeometric series. Solution by definite integrals of Laplace's equation and Bessel's equation. Systems of linear equations with constant variable co-efficients.

## STANDARD TO BE FOUND IN—

(A) {	Forsyth's Treatise	Chapters II—IV.
	Goursat	Chapters II—III.
(B) {	Forsyth's Theory, Vol. IV.	Chapter I nearly complete.
	Goursat	Chapters II—III greatly restricted.
(C) {	Forsyth's Treatise	Chapters V, VII and
	Goursat	Chapter VIII restricted. Chapter III.

## BOOKS RECOMMENDED :—

- A. R. Forsyth. (1) Treatise on Differential Equations.  
 (2) Theory of Differential Equations. Part III, Vol. IV.  
 Goursat's Mathematical Analysis Vol. II, Part II (English Translation).

## (11) STATISTICS.

## A. PROBABILITY :—

- I. Definition. Laws of addition and multiplication.  
 II. Elementary probability law and integral probability. Laws of Random variable, simultaneous probability, laws of number of variables :—

## APPLICATIONS.

If  $X_1, X_2, \dots, X_n$  are  $n$  variables such that  $p(X_1, X_2, \dots, X_n)$  is their simultaneous probability law,

$$(i) \ p(X_1, X_2, \dots, X_n) = \int_{-\infty}^{\infty} p(X_1, X_2, \dots, X_n) dX_n \text{ and}$$

its immediate extension.

$$(ii) \text{ If } y_1, y_2, \dots, y_n \text{ are } n \text{ functions of the } x\text{'s, } p(y_1, y_2, \dots, y_n) =$$

$$p(X_1, X_2, \dots, X_n) \frac{\delta(y_1, y_2, \dots, y_n)}{\delta(X_1, X_2, \dots, X_n)}$$

(iii) Relative probability Law.—

$p(X_1, X_2) = p(X_1) p(X_2|X_1)$ , where  $p(X_2|X_1)$  is the probability law of  $X_2$  for a given  $X_1$ .

III. Mathematical Expression. Applications.

IV. Baye's Rule : Its criticisms.

V. Fourier's Inversion formula *vis.*

If  $\Theta(it)$  = expectation of  $e^{ixt}$

$$= \int_{-\infty}^{\infty} e^{ixt} p(x) dx.$$

$$\text{then, } p(x) = \frac{1}{2\pi i} \int e^{ixt} \Theta(it) dt$$

Simple application.

(i) If  $\Phi(t)$  = Expectation of  $x^t$

$$= \int_{-\infty}^{\infty} x^t p(x) dx$$

$$p(x) = \frac{1}{2\pi i} \int_{-t-1}^{-t+1} \Phi(t) dt.$$



- (ii) If  $x$  and  $y$  are independent and  $z=x+y$ ,  $\phi^z(it)=\phi_x(it)+\phi_y(it)$ , where  $\phi^z(it)=\int e^{ixt} p(z) dz$ .

VI. Application of probability to simple problems in Insurance and Mortality Tables.

B. STATISTICS.

- I. ELEMENTARY PRINCIPLES :—Collection of data, charts, and diagrams, Frequency curves, the method of samples in the study of large populations.
- II. STATISTICAL AVERAGES :—The Arithmetic Mean, Mode and Median, Index numbers, Geometric and Harmonic Means.
- III. DISPERSION :—The Standard Deviation, the Average Deviation, Semi-interquartile Range, Probable Error.
- IV. CORRELATION :—Definition of Regression : If  $x$  and  $y$  are two variables, the regression of  $x$  on  $y$  is  $xy$ —Expectation of  $x$  for a given value of  $y=\int x p(x/y) dx$   

$$=\int x p(xy) dx / \int p(xy) dx.$$

Linear Regression, Correlation Co-efficient. Multiple and Partial Regression, Multiple Correlation Surface in the case when all the regression equations are linear.

Distinction between Independence and non-correlation :—

- (a)  $p(x, y)=p(x) \cdot p(y)$  for independence.
  - (b)  $\Sigma(xy)=\Sigma(x) \cdot \Sigma(y)$  for non-correlation.
- (a) implies (b): but not the converse.

V. NON-LINEAR REGRESSION.—Correlation Ratio. Methods of Continuity and Association.

VI. THE NORMAL CURVE OF ERROR :—

- (i) Binomial Distribution; Normal Curve as the limit of the Binomial.
- (ii) The Principle of the Arithmetic Mean, Derivation of the Law of Error.
- (iii) Hagen's Hypothesis. Deviation of the Law of Error.
- (iv) Method of Least Square and the outline of the method of Gauss Normal Equations.

VII. ESTIMATION :—

- (i) Method of maximum likelihood. Consistent statistics. Sufficient statistics, Efficient statistics. Biased and Unbiased Estimates.
- (ii) The Method of Moments. Pearson's Curves.

VIII. TESTING HYPOTHESIS.

- (i)  $\chi^2$  Test.
- (ii) Students'  $t$  test : Fisher's  $z$  transformation.
- (iii) Neyman Person  $\lambda$  criterion.

IX. DESIGN OF EXPERIMENTS.—

- (i) Randomised Blocks.
- (ii) Latin Squares.

BOOKS RECOMMENDED FOR STUDY.—

1. Introduction to the Theory of Statistics—Yule (Revised Ed.)
2. Methods of Statistics—Tippet.
3. Elements of Probability—Levy and Roth.
4. Combination of Observations—Brunt.

5. Mathematical Statistics—Reitz.
6. Statistical Methods for Research Workers—Fisher.
7. First Course in Statistics—Jones.

BOOKS FOR REFERENCE :—

1. Probability—Arne Fisher.
2. Probability—Coolidge.
3. Probability—Burnside.
4. Design of Experiments—R. A. Fisher.
5. Analysis of Variance—Sneececer.
6. Statistical Methods—Secrest.
7. Elements of Statistics—Bowley.
8. Calculus of observation—Whittaker.
9. Frequency Curves and Correlation—Elderton.
10. Papers appearing in Biometrika, Metron, Annals of Mathematical Statistics and Philosophical Transactions—Sankya.

THE FOLLOWING PAPERS DESERVE CAREFUL READING :—

1. On the Mathematical foundations of theoretical statistics :  
R. A. Fisher (Phil. Trans. A. Vol. 222 pp. 309-368).
2. An application of Characteristic Functions to the Distribution Problem of Statistics: Solomon Kullback (Annals of Mathematical Statistics, Vol. 5 No. 4, 1934).
3. Theory of Statistical Estimation. R. A. Fisher (Proc. Camb. Phil. Soc. Vol. XXII part 5).
4. Inverse Probability. Fisher (Proc. Camb. Phil. Soc. Vol. XXVI part 4).

## BRANCH II.

### Physics—(Main).

#### DETAILED SYLLABUSES.

##### MECHANICS OF SOLIDS AND FLUIDS.

**GENERAL.**—Translatory motion—Laws of motion and Kinematical equations—Motion in a plane curve—Tangential and normal accelerations—Rotatory motion—Degrees of freedom—Kinematic equations for a rotating rigid body—Moment of inertia and its evaluation for bodies of definite geometric shape—Rolling bodies ; horizontal and inclined plane surfaces—Resisted motion—Resistance proportional to velocity and to square of velocity—Application to projectiles in air.

**VIBRATORY MOTION.**—Simple Harmonic motion—Sphere rolling on a concave surface—Simple pendulum in a definite arc—Spherical pendulum—Conical pendulum—Bifilar suspension—Compound pendulum—Kater's pendulum and accurate determination of 'g'—Variation of 'g' with latitude—Gravity Balance—Centre of percussion—Ballistic balance and pendulum—Composition of simple Harmonic motions—Lissajou's figures—Fourier's theorem—Analysis of a periodic curve by ordinate measurements—Damped and forced oscillation—Resonance—Resonance curves and sharpness of Resonance—Coupled oscillations—Symmetric and asymmetric systems.

**GYROSCOPIC MOTION.**—Precession—Precessional, gravitational, Centrifugal and Centripetal torques—Lanchester's Rule—Gyrostatic pendulum—Rolling disc with plane horizontal and inclined—Angular momentum—Angular acceleration of steady precession of a top—Nutation—'Sleep' of the top Gyrocompass.

**ATTRACTION AND POTENTIAL.**—Law of Gravitation—Inverse square law—Attraction and potential due to thin rod, thin ring, thin disc, thin spherical shell, thick spherical shell and solid sphere—Gravitation constant and its accurate determination—Nature of gravitation—Einstein's hypothesis—Kepler's laws—Central forces and planetary motion—D'Alembert's Principle—Principle of virtual work—Principle of least action and the Hamiltonian principle—Special theory of relativity and the consequent modifications of the Kinematical equations of motion.

**VECTOR ANALYSIS.**—Concept of a Vector—Addition and subtraction of vectors—Multiplication of a vector by a Scalar—The scalar product of two vectors—The vector product of two vectors—Differentiation of a vector with respect to a scalar—Application to theory of space curve—Space derivatives of a scalar quantity—The curl of a vector—The divergence of a vector.

**HYDROMECHANICS.**—Equation of continuity—Application to fluids and solids—Theorems of Bernoulli and Torricelli—Wave motion—Canal and surface waves in water—Capillary waves—Simple harmonic progressive waves—Stationary waves—Sound waves in a gas—Energy considerations for the several kinds of waves.

#### PROPERTIES OF MATTER.

**ELASTICITY.**—Stress. Strain, axes of strain—Principle of superposition—Moduli of elasticity and their inter-relations—Bending of beams and thin rods—Euler's theory of struts—Reciprocal relations—Stability of loaded pillars—Elastic curves—Torsion of rods and strips—Torsional and coupled oscillations—Accurate methods of determining elastic moduli including optical interference methods—Spiral springs, flat and oblique—Transverse vibrations of a loaded pillar—Photo elasticity—Elasticity and temperature.

**PRODUCTION AND MEASUREMENT OF HIGH PRESSURES.**—Compressibility of liquids and gases—Isothermal and adiabatic bulk modulus—Experimental determination of bulk modulus of solids and liquids.

**SURFACE TENSION.**—Capillary elevation in cylindrical tubes and between parallel plates—Shape of the meniscus—Pressure on curved membranes—Stability of nearly cylindrical films—Theory of Sessile and pendant drops—Angle of contact—Methods of determining Surface tension, interfacial tension and angle of contact based on above—Rayleigh's method of ripples—Phenomena in thin films; effect of contamination—Thermodynamical considerations—Vapour pressure over a curved surface—Theory of capillarity and evaluation of Laplace's constant.

**VISCOSITY.**—Newton's law—Theory of steady flow of liquids and gases in capillary tubes—Critical velocity and turbulence—Coefficient of viscosity of liquids and gases by Poiseuille's method with necessary corrections—The revolving cylinder and the revolving disc methods—Variation of viscosity with temperature and pressure—Stokes's falling body viscometer—Viscosity of mixtures and solutions—Theory of lubrication.

**KINETIC THEORY.**—Evaluation of mean free path of a gas molecule from its coefficient of viscosity—Effect at low pressures—Properties of gases at high pressures—Evaluation of the size of the molecule—Determination of Loschmidt's number.

**OSMOSIS AND DIFFUSION.**—Laws of osmosis and diffusion—Fick's law of diffusion—Coefficient of diffusion and interdiffusion and their experimental determination—Thermodynamical considerations of vapour pressure of a solution—Brownian movement—Determination of Avogadro's number from observations of colloidal particles in a vertical column.

**PRODUCTION AND MEASUREMENT OF VACUA.**—Theory and working of molecular, diffusion and condensation pumps—McLeod gauge—Viscosity manometers—Radiometer and ionisation gauges—High vacuum technique and accessories.

#### HEAT.

**GENERAL.**—Mercury and gas thermometers—Standard gas thermometers—Perfect gas scale—Reduction of readings of a gas thermometer to the perfect gas scale—Resistance and Thermo-electric thermometers—Linear expansion of solids and crystals—Expansion of liquids—Specific heat of solids and liquids over wide ranges of temperature—Specific heat of water—Specific heat of gases at constant volume and at constant pressure—Ratio of specific heats—Calorific value of fuels—Bomb calorimeters—Latent heat of fusion and vaporisation—Total heat—Trouton's rule—Accurate methods of determining vapour pressure and vapour density—Continuity of state—The equation of Vander Waals and its modifications by Dieterici, Onnes and others—Laws of corresponding States—Determination of critical constants—Liquefaction of gases—The porous plug experiment—Huxton's apparatus—Liquefaction and solidification of H. and He.

**THERMAL CONDUCTIVITY.**—Rectilinear flow—Fourier's linear diffusion law—Conductivity by Forbes's and Angstrom's methods—Electrical methods of Kohlrausch—Shell and disc methods for poor conductors—Conductivity of crystals—Conductivity of liquids and gases—Weidemann—Franz law—Relation between the thermal conductivity of a gas and its coefficient of viscosity.

**THERMODYNAMICS.**—First law—Application to specific heats of a gas and change of state—Work done in isothermal and adiabatic expansions of a gas.

Reversible and irreversible cycles—Carnot's cycle—Efficiency—The second law—The thermodynamic scale of temperature—Maxwell's thermodynamical relations and application to specific heats, Joule Thompson effect and corrections for a gas thermometer—Entropy—The entropy of a perfect gas and a mixture of gases—Entropy and unavailable energy—Thermodynamical potential at constant pressure and at constant volume—Applications to change of state—Equations of Clapeyron and Clausius—Specific heat of saturated vapour—Triple point.

Steam Engine—Rankine' cycle—Internal combustion engine—The Otto and Diesel cycles—Refrigerators—Coefficient of performance.

**RADIATION.**—Theory of exchanges—Kirchhoff's law—Blackbody radiation—pressure of radiation—Boltzmann's proof of Stefan's law—Determination of Stefan's constant—Radiometers and Radiation pyrometers—Optical pyrometers—Wien's distribution law—Adiabatic expansion of radiation Wien's displacement law—Number of independent vibrations of a continuous medium—The radiation formulae of Planck and Rayleigh—Experimental verification—Determination of Planck's constant.

**SPECIFIC HEATS AND QUANTUM THEORY.**—Specific heat of solids—Dulong and Petit's law—Einstein's theory—Debye's theory for isotropic solids—Specific heat of gases—Degrees of freedom and equipartition of energy—Specific heat of hydrogen at low temperatures—Application of quantum theory to diatomic gases.

#### SOUND.

Plane and spherical waves—Speed of propagation of longitudinal waves in a fluid and transverse waves in a string—Theory of vibrations of strings, bars, plates, membranes and pipes—Fourier's theorem and its application to strings plucked, struck or bowed—Torsional and transverse vibrations of bars—Applications to tuning fork—Chladni's figures.

Forced vibration—Resonance—Sharpness of resonance—Multiple resonance—Simple theory of resonators—Resonators with variable neck and multiple openings—Theory of combinational tones.

Vortex formation and Aeolian tones—Vibration of air in wide tubes—End-correction—Conical tubes—Edge tones.

Maintenance of vibrations—Singing flames—Concord and discord—Theory of vowel sounds—Theories of audition—Threshold of hearing—The unit decibel.

Quality of sound—Acoustic spectra—Phonodeik—Rayleigh's disc and phonometer—Hot wire microphone—Acoustic filters—Acoustic impedance, inductance and capacitance—Applications to measurements of intensity of sound and absorption coefficients.

Reflection, Refraction and diffraction of sound—Doppler effect—Sound wave photography—Acoustics of buildings—Spark and ripple tank methods.

Absolute measurements of frequency—The piezo-electric oscillator—Ultrasonics.

Microphones—Loud speakers.

#### LIGHT.

**GEOMETRICAL OPTICS.**—Thin lenses and lens system—Thick lenses—Nodal points and cardinal points—Dispersion and dispersive power—Achromatic combination of prisms and lenses—Spherical aberration—Aplanatic points—Astigmatism—Sine and tangent conditions—Application to telescope and microscope.

The Rainbow—The experiments of Airy and Miller.

Prism spectroscopes—Spectroscopy of the infra-red, visible and ultra-violet—Hartman's formula—Refractometers of Abbe and Pulfrich—Spectrophotometry—The Hilger Sector Photometer.

### PHYSICAL OPTICS.

Velocity of light—Wave velocity and group velocity—Application of Huyghens's principle and Fermat's law to the study of reflexion and refraction—Caustics.

INTERFERENCE. Colours of thin films—Interference in thick plates—Haidinger's fringes—Brewster's bands—The refractometers of Jamin and Rayleigh; Michelson's interferometer—Fabry and Perot's etalon—Lummer and Gohroche plate—Lipmann's colour photography.

DIFFRACTION. Elementary theory for straight edge, narrow obstacle, narrow rectangular aperture, circular aperture and circular obstacle—Babinet's principle—Graphical methods of investigation of the intensity of the diffraction patterns in the above cases. Fresnel's theory of diffraction at a straight edge—Cornu's spiral—Fraunhofer phenomena and determination of maxima and minima in the case of one or more rectangular apertures—The plane grating; Transmission and reflexion—Concave grating—Michelson's echelon—Grating spectroscopy—Resolving power of a grating, prism, telescope and microscope—Diffraction effects and definition of optical images.

POLARISATION. Double refraction—Construction of wave surface for uniaxial crystals—Experimental verification—Fresnel's theory of double refraction; axes of single wave and single ray velocities—Internal and external conical refraction—Interference of polarised light—Colours of thin crystalline plates in parallel and convergent plane polarised light—Isochromatic and achromatic lines in uniaxial and biaxial crystals—Fresnel's rhomb—Babinet's compensator—Analysis of polarised light—Elliptical polarisation by reflexion—Rotatory polarisation—Fresnel's explanation—Cornu's prism—Polarimetry—Rotatory dispersion—Faraday effect.

ELECTROMAGNETIC THEORY OF LIGHT. Derivation of Maxwell's equations—Deduction of the laws of reflexion and refraction for transparent media—Explanation of total reflexion and metallic reflexion—Theory of dispersion—Normal and anomalous dispersion—Theorems of Cauchy, Sellmeier and Helmholtz—Selective reflexion—Residual rays—A general account of the Zeeman, Stark and Kerr effects.

### ELECTRICITY.

ELECTROSTATICS. Gauss's theorem and its applications—Capacities of systems of conductors—Energy due to a system of charges—Explanation in terms of Faraday tubes—Tension and pressure in Faraday tubes—Energy per unit volume of dielectric—Boundary conditions of intensities in media of different S. I. capacities—Electrometers—Measurement of capacity, S. I. C. and charge with electrometers—Modern electrostatic machines and electrostatic voltmeters—Method of images and common applications—Conducting and dielectric spheres in uniform field.

MAGNETISM AND MAGNETIC INDUCTION. Potential and field due to a short magnet—Forces between two small magnets—Magnetic shell—Mutual potential energy of a shell and an external magnetic system—Field due to a uniformly magnetised sphere—The earth's field and the nature of its variable component—Magnetic induction and hysteresis—Energy losses due to hysteresis—Methods of measuring permeability and susceptibility—Magnetic balances—Modern electromagnets—Paramagnetism and diamagnetism—Molecular theories of magnetism.

ELECTRIC CIRCUITS AND ELECTROMAGNETISM. Krichhoff's laws—Theory of the Wheat-Stone's net—rate of heat production in distributed circuits, use of the dissipation function—Kelvin's double bridge—Ampere's law for the magnetic field due to any closed linear circuit—Evaluation of the magnetic field due to a current in a straight conductor, straight solenoid and endless solenoid—Helmholtz galvanometer—Mechanical force on a conductor carrying a current when in a magnetic field—Mutual forces between two coaxial circular currents—Current balances of Rayleigh and Kelvin.

Coefficient of self and mutual induction—Growth and decay of current in an inductive circuit under constant E. M. F.—Current and total charge in secondary—Calculation of L. and M. in circuits of simple shape—Theory of D. C. and A. C. generators and motors—Circuit with resistance, inductance and alternating E. M. F.—Impedance, reactance and power factor—Wattmeters—Skin effect—Shielding

effect of a mass of metal—Theory of transformers—Repulsion between a conductor and an A. C. circuit—Rotation of magnetic field—Alternating E. M. F. acting in a circuit containing capacity, inductance and resistance—Oscillatory discharge of a condenser—Choking coils—Oscillographs.

Thermodynamical study of reversible cells and of the Peltier and Thomson effects.

UNITS, DIMENSIONS AND ELECTRICAL STANDARDS. Ratio of the E. M. to the E. S. unit—Absolute measurement of resistance, Rayleigh's and Lorenz's methods—Maxwell's method for capacities—The E. C. E. of silver and the E. M. F. of a standard cell; absolute measurements.

ELECTROMAGNETIC WAVES. Maxwell's fundamental equations—Poynting's theorem—Hertz's experiments—Stationary waves; determination of wave-length—Oscillators and detectors—Cymometers—Determination of dielectric constants by oscillations—Thermionic valves and their characteristics.

### MODERN PHYSICS.

CONDUCTION OF ELECTRICITY IN GASES. Spark discharge; Paschen's law—Discharge under low pressure—Cathode rays and their properties—Roentgen Rays and their properties—Determination of  $m/e$  and  $V$  for Cathode Rays; Thomson's and Kaufman's experiments—Photoelectric method—Ionisation in gasses—Saturation current—Positive and negative ions—Wilson tracks—Determination of  $e$ ; method of Wilson, Thomson and Millikan—Canal rays—Thomson's experiments on positive rays—Mass spectrograph—Photo electricity—Experimental laws—Thermionic emission and the associated measurements—The electron as a fundamental unit.

RADIO ACTIVITY. Experimental facts—Radium— $\alpha$ ,  $\beta$  &  $\gamma$  rays; their nature and properties. The measurements of  $m$ ,  $e$  and  $v$  for  $\alpha$  &  $\beta$  rays. The penetrating power of the rays. Important radioactive changes.

ELECTRON THEORY. Electrons as current carriers—The motion of electrons in an electric and magnetic field. The electron theory as applied to (1) metallic conduction (2) heat conduction (3) dielectric polarisation (4) refractive index (5) optical dispersion and (6) thermoelectricity. Magnetism as due to revolving electrons; Explanation of dia, para and ferromagnetism. Magnetic susceptibility—Simple Zeeman effect; Faraday and Kerr effects.

PASSAGE OF ELECTRONS THROUGH MATTER. Cloud track photographs—Thickness of material, absorption and velocity—Collision and secondary electrons—Energy considerations.

SCATTERING OF X-RAYS. Photo-electrons—Characteristic radiation—Absorption of X-rays and X-ray spectrometry—X-ray spectrum of elements—Moseley's work.

PASSAGE OF  $\alpha$  RAYS THROUGH MATTER. Collision with nuclei and the accompanying phenomena.

ATOMIC STRUCTURE. Nucleus—Atomic number—Aston's mass spectroscopy and isotopes—Electron, proton, neutron and positron—Artificial radioactivity.

SPECTRA. The several types of spectra and methods of producing them—Balmer Series—Ritz's formula—Rutherford atom model—Bohr's theory of the Hydrogen spectrum—Stationary orbits—Energy levels and principal quantum numbers—Application to ionised helium—Elliptic orbits—Effect of mass and velocity of nucleus and electrons—Rotation of the axes of the ellipse—Combination, correspondence and exclusion principles—Orientation of orbits—Stem Gerlach experiment—Further study of the Zeeman effect—Spin electrons—Magnetron—Stark effect—Fine structure of spectral lines—Doppler and other effects—The scattering of light by small particles and molecules—The photon and the quantum theory—Mass and energy of photon—Compton effect—Raman effect—Corpuscular property of light—Wave property of electron—Electron diffraction—Analogy between the principle of least action and Fermat's principle—De Broglie's theory—Schrodinger's wave equation—Application to the Hydrogen atom—Arc spectra of alkali metals—Optical spectra of elements of higher valency—Selection rules—Absorption spectra—X-ray spectra—K. L. M. series—Periodic classification of elements—Experimental study of molecular and Band Spectra.

## L. T. Degree Examination.

### A. GENERAL PRINCIPLES OF EDUCATION.

(1) THE APPROACH TO EDUCATION : HISTORICAL—Outlines of ideal and practice in Ancient, Mediaeval and Modern times.

(2) THE APPROACH TO EDUCATION : SCIENTIFIC—Need for the aid of Biology, Physiology, Psychology, Sociology, Logic and Statistics.

(3) AIMS OF EDUCATION AND THEIR EVALUATION.—Livelihood, Learning ; Social efficiency ; Character ; Leisure.

(4) THE EDUCATIVE PROCESS :—

- A.
  - i. as the sharing of Traditions or Social Heredity.
  - ii. as the achievement of many-sided interest.
  - iii. as adjustment between the individual and his environment.
- B.
  - i. THE NATURE OF THE ENVIRONMENT :—The world of Nature, the world of Men, the world of Values.
  - ii. THE NATURE OF THE INDIVIDUAL :—Need for the study of general development of body, intellect, skills, character, sociability, taste. The problem of Individual Differences.

C. CONSEQUENT PROBLEMS :—

- i. Child and Subject : Learning and Teaching : individual and Society (School, Home, State).
- ii. The problem of the curriculum. What to learn and teach.
- iii. The problem of Method. How to learn and teach.

(5) ASPECTS OF THE CURRICULUM :—

- (a) Dependence upon aim.
- (b) Theory of Formal Discipline.
- (c) Knowledge and experience.
- (d) Instrumental subjects—Reading, Writing, Arithmetic.
- (e) The place of Physical activities, Handwork, Art, Music, Literature, History, Geography, Mathematics, Science.
- (f) Integration of the Curriculum.
- (g) The problem of pre- vocational and vocational training.

(6) ASPECTS OF METHOD :—

- (a) Child and Class : Play and Work.
- (b) Theories underlying some modern methods, e. g.—The Montessori Method. The Dalton Plan, the Project Method. The Winnetka Plan. The Decroly Class.

### B. EDUCATIONAL PSYCHOLOGY.

1. INTRODUCTION.—What is Psychology? Relation to Educational Psychology Educational Psychology—its scope and methods.

2. Basic Factors.—The Psycho-Physical Organism. Physiological basis of mental life, including the nervous and Glandular systems, the senses, the sensori-motor arc. Human behaviour, variable and non-variable—stimulus and response—Conditioning, Heredity and Environment. The Problem of Consciousness—The three aspects of mental life, cognitive, affective, conative. Instinct and Intelligence.

3. KNOWLEDGE and LEARNING.—The training of the senses—Methods of sense-training. The Montessori Method. The study of cognition—sensation, perception, conception, apperception, memory association, imagination, judgment, thinking, reasoning. Attention, interest and effort. The Laws of Learning—Remembering and Forgetting—the transfer of training—Fatigue. Stages of mental development. The General Nature of Knowledge—the stages in the growth of knowledge—place of language in the growth of knowledge—observation, classification, definition, explanation—Psychology of the Herbartian steps.

4. **THE GROWTH OF CHARACTER.**—Instincts, their structure and classification—Instinctive Behaviour and its modification. The importance of Play. Imitation and suggestion. Feelings, emotion and sentiments—The unification of personality. Habits, will and character. The Group Mind. The Unconscious in Education. Mental Conflicts, the problem of Discipline. Stages of development.

5. Individual Differences due to heredity, environment, sex, capacity and growth.

6. **SOME PRACTICAL APPLICATIONS**—Intelligence—its nature and measurement—Educational Tests—their uses and value. Care of the gifted and the dull the difficult and the physically handicapped. How to study—The laws of Learning illustrated by reference to Handwriting, Reading, Arithmetic, Spelling, History and Poetry. Learning Curves.

### C. GENERAL METHODS.

**TEACHING**—Aims—Maxims of method—Lesson planning and notes of lessons  
**TYPES OF LESSONS**—Determined by aim—Inductive—Deductive—Drill—Review by Lecture—Appreciation—Discussion—Laboratory—Demonstration—Heurism—Supervised Study.

**TEACHING AIDS AND DEVICES**—Assignments—Questions—Answers—Exposition—Illustration—(verbal—concrete)—Black-board—Text Books—Home-work. Note-books, etc.

**CLASSIFICATION OF PUPILS.**—Measuring Devices—Tests—Marking—Examinations (essay type and new type)—Promotions.

**CLASS MANAGEMENT.**—Economy of Time—Securing and maintaining attention—Influence of Teacher—Typical Problems.

**DISCIPLINE.**—Changing conceptions of school discipline—Typical problems—Direct Control (Curative)—Indirect Control (Preventive) Rewards and Punishments.

**MORAL EDUCATION**—Direct and indirect ways of moral education Ethical—Social appreciation—Aesthetic appreciation.

**MODERN TENDENCIES.**—Individual and Class Teaching—Experiments in “Adjustment to individual differences” and “Socialisation” such as Dalton Plan—Project Method.

### D. SCHOOL ORGANISATION AND SCHOOL HYGIENE.

**MATERIAL CONDITION.**—Site—Building—Rooms—Lighting—Ventilation—Furniture—Play Ground—Garden—Sanitary Arrangements.

**MANAGEMENT.**—Staff-meeting—Time-table—Libraries—Museum—Co-operation between School and Home—School Office and Records.

**SCHOOL LIFE.**—Corporate life—School Assembly—Clubs and Societies—Hobbies—Self-Government—Games—Scouting—Excursions—School Magazines—Exhibitions—School Celebrations.

**HOSTEL.**—Location—Supervision—Sanitation—Equipment—traditions.

**STAFF.**—The Headmaster and his duties—Class teacher vs. Subject teacher and his relation to others—Inspection—Professional etiquette—Professional Organisation.

#### HYGIENE.—

(a) Children's diet—Cleanliness of food—Feeding of School children.

(b) Clothing—Use and characteristics of good clothing.

(c) Cleanliness—Relation to health.

(d) Fatigue—Mental and Physical.

(e) The senses and their training—Defects of vision—Common eye diseases—Causes, signs and prevention of defective hearing and ear diseases,

(f) Training the child in the practice of Hygiene.

(g) Physical Education.

(h) The question of Sex Education.

(i) Medical Inspection—School Clinics.



- (j) Common ailments.
- (k) Infectious diseases—Symptoms, treatment, isolation.
- (l) Temperance.
- (m) School Buildings and surroundings. Furniture and Equipment—Posture.
- (n) First aid in minor injuries.
- (o) Health Legislation affecting schools.

## E. (b) METHODS OF TEACHING ENGLISH IN INDIA.

### A. GENERAL.

I. THE POSITION OF ENGLISH IN INDIA.—Discussion of the aims of learning English in India. The bilingual problem in India and other countries. The question of the medium of instruction. Books on the teaching of English. The limited usefulness in India of such books written for (a) English and (b) continental pupils because of the different situation and needs of those pupils. Brief comparison of English and South Indian Vernaculars. The influence of good teaching of the mother tongue on the learning of English.

II. METHODS OF TEACHING MODERN LANGUAGES. The translation and grammatical method. Reasons for the rejection of the rigid application of this method in the teaching of school children.

Reform methods : (1) the natural method : (2) the direct method, its aims and principles. Criticism of certain of its tenets and of their application : (3) Basic English.

The complete method, aiming at the development of all aspects of language learning with a view to achieving practical results.

III. PSYCHOLOGY OF LANGUAGE LEARNING APPLIED TO THE TEACHING OF ENGLISH IN INDIA—Interest, imitation, habit formation, etc., in the teaching of English. The use of individual and group methods. The art of questioning in English teaching. The play way of teaching English. Word counts achievements.

IV. THE ORGANISATION OF ENGLISH TEACHING IN SCHOOL—A consideration, based if possible on a survey made by students in one or more schools, of (a) the stage at which the study of English is begun, (b) the time devoted to English in different forms, (c) time devoted to languages in different forms, (d) schemes of work and the time given to different aspects of English teaching.

The English teacher, the school library, the school museum and collections of pictures as used in the teaching of English. The English class room.

Teachers' notes of lessons. The importance of complete records of English teaching and of work done (e. g. new words and phrases taught). The co-operation between teachers of English and teachers of other subjects.

Examination in English. (1) internal examination and their organisations; the scope and form of such examinations. (2) the external examination. Consideration of the S. S. L. C. examination and its influence on the teaching of English. (3) standardised achievement tests in English.

### B. THE TEACHING OF ENGLISH IN THE EARLY STAGES (To Form III).—

1. ORAL WORK.—CONVERSATION—the value of sub conscious comprehension before speech; the question of the priority of conversation or reading; the importance of repetition; the importance of simplicity of language and the grading of vocabulary and sentence forms; the use of pictures and objects to prevent the undue intervention of the mothertongue; the use of drama and play methods.

TEACHING OF PRONUNCIATION.—The Psychological and physiological bases of speech, elements of phonetics with particular reference to speech sounds in English that present difficulty to Indian pupils. An elementary study of intonation. Practical exercises in voice production.

1. READING—THE BEGINNINGS OF READING. Different methods of teaching reading to beginners—a comparison between the problem of learning to read the first and second languages.

**DETAILED STUDY.**—THE TEXT AS THE CENTRE OF INSTRUCTION ; EXTENT TO WHICH DIGRESSION IS DESIRABLE. METHODS OF EXPLAINING THE MEANING OF WORDS, PHRASES AND IDIOMS. THE USE OF THE MOTHER-TONGUE IN EXPLANATION, EXTENSION OF ACTIVE AND PASSIVE VOCABULARY. RELEVANT GRAMMAR FOR UNDERSTANDING THE TEXT. DRILL IN THE USE OF NEW WORDS AND PHRASES. PUPILS' WORD AND PHRASE BOOKS, THEIR ARRANGEMENT, TYPES OF EXERCISES BASED ON THE READER FOR ORAL AND WRITTEN WORK. REQUISITES OF A GOOD READER. CONSIDERATION OF EXISTING READERS—the reasons for the use of word frequency lists on a graded vocabulary basis. A consideration of vocabulary and sentence forms to be taught at different stages.

**EXTENSIVE READING.**—THE FUNCTION AND TREATMENT OF NON-DETAILED TEXTS, CREATION OF INTEREST IN READING. The stage at which extensive reading should be introduced. THE IMPORTANCE OF SILENT READING. THE FORMATION AND USE OF CLASS LIBRARIES.

**III. POETRY.**—The stage at which this teaching should be begun. Selection of suitable poetry for different stages. METHODS AND AIMS IN TEACHING POETRY, AS CONTRASTED WITH THE TEACHING OF PROSE. THE TEACHING OF RECITATION.

**IV. GRAMMAR.** VIEWS REGARDING THE FUNCTION OF GRAMMAR IN THE LEARNING OF LANGUAGES. The unconscious assimilation of grammatical forms, a preparation for the formal learning of grammar. INDUCTIVE AND CONCENTRIC METHODS OF TEACHING GRAMMAR. CORRELATION WITH THE STUDY OF TEXTS. Stage at which the study of formal grammar should be begun and the content of a middle school grammar syllabus. Consideration of grammar text books for beginners and their place in the teaching of English. Formation of concentric graded Syllabuses. THE NEED FOR UNIFORMITY IN GRAMMATICAL TERMINOLOGY. The medium of instruction in grammar. THE CONNECTION BETWEEN THE TEACHING OF THE GRAMMAR OF THE MOTHER-TONGUE AND OF ENGLISH.

**V. HANDWRITING, SPELLING AND PUNCTUATION.**—Cursive and script writing. The use of copy books. Transcription. Attention to particular difficulties in and stage of introducing the formation and joining of letters, spacing and syllabification, etc. ATTENTION TO HANDWRITING IN ALL KINDS OF WRITTEN WORK. Spelling and dictation. The teaching of punctuation.

**VI. COMPOSITION.** CORRELATION WITH THE TEACHING OF THE TEXT, GRAMMAR AND WORD LISTS. Progress from reproduction to free composition ; the importance of fluency exercises and oral work. THE USE OF EXERCISES DESIGNED TO CORRECT COMMON ERRORS IN INDIAN USAGE—Story reproduction, the use of dialogue, drama and pictures. Types of composition suitable to the early stages. INFORMAL TESTING—NEW TYPE TESTS. THE SETTING, CORRECTION AND RETURN OF TESTS. THE IMPORTANCE OF THE CAREFUL CORRECTION OF WRITTEN WORK BY THE PUPILS.

#### C. THE TEACHING OF ENGLISH IN THE HIGHER STAGES FORMS IV, V AND VI.

The syllabus given below is intended to supplement the relevant portions in the corresponding sections of the syllabus for the early stages. These portions should be referred to again in connection with the teaching of High School pupils.

**I. ORAL WORK.**—The importance of the oral preparation of essays and of oral summaries, narratives and discussions based on reading. Recitation of prose and verse.

**II. READING.**—**DETAILED STUDY.**—Sentence and paragraph study. The choice and use of words. The use of dictionaries. Oral and written exercise suitable for use with detailed texts. The place for the study of language and of literature in the teaching of English.

**EXTENSIVE READING.**—Book lists for High School forms. The place and importance of vocabulary selection in the editing of books for extensive reading. Oral and written exercises based on extensive reading.

**STUDY OF ENGLISH LIFE AND CUSTOMS.**—Stage at which this should be introduced, methods of study. Contrast between the conditions of Indian and French or German pupils in this connection.

III. POETRY.—Different types of poetry suitable for study in the High School. Mood as important as meaning. Knowledge of back ground, visualisation, study of choice of words, rhyme, and rhythm, all aids to appreciation. Explanation of simple figures of speeches found in texts. Methods of procedure and oral and written exercises suitable for use in poetry lessons.

IV. GRAMMAR.—Universal grammar and English Grammar. The function and form of words. Word order. The importance of analysis. The purpose of drill exercises in the transformation of sentences. A consideration of existing grammar books. The formation of graded syllabuses. Methods of teaching grammar in High School forms. Correlation with the teaching of the detailed text and composition.

V. HANDWRITING, PUNCTUATION AND SPELLING. Syllabification. The punctuation of abbreviations. Recognition of right and wrong spelling.

VI. COMPOSITION. Types of composition suitable for the higher stages. (a) essays, narrative, descriptive and reflective. (b) letter-writing, (c) epitome, (d) expansion, (e) paraphrase. The importance of concreteness in topics set for composition. The construction of the essay. Principles of sentence and paragraph structure. Oral and written preparation essential. Inductive methods of teaching composition. Correlation with the study of good prose in intensive and extensive reading. Systematic correction and valuation of written exercises. Code of corrections for large classes.

VII. TRANSLATION.—Its practical and linguistic value. Principles of translations. Stage at which it should be introduced. Correlation with the study of grammatical and idiomatic differences between English and the mother-tongue.

#### E (d) THE TEACHING OF MATHEMATICS.

##### 1. Aims in Teaching Mathematics.

(i) The nature and scope of Mathematics ; its relation to other branches of knowledge, i. e., physical and natural sciences, logic, philosophy and economics.

(ii) Value of Mathematical education, practical, disciplinary and cultural.

##### 2. The content and organisation of school mathematics.

(i) Curriculum construction. History of Mathematics. Curriculum in our schools. Modern tendencies, Compulsory and elective courses. Nature of mathematical ability. The syllabus : Primary, lower and upper secondary courses.

(ii) Organisation of the curriculum :—The logical and psychological orders of development. Topical versus spiral method, Incidental versus systematic development. Projects and activity programmes. Correlation with life and the other subjects of the curriculum. Correlation of the different branches of Mathematics among themselves. Correlation of the different topics of the same branch.

##### 3. Methods of teaching Mathematics.

(i) The value of the study of History of Mathematics and Mathematics teaching. The development of Mathematical knowledge by empirical, intuitional, creative and rational processes. History of the important topics of elementary Mathematics, e. g., notation, 'metric system, directed numbers, function concept, parallel postulate. Contribution to the pedagogy of Mathematics by eminent educators, e. g., Forebel Herbart and Montessori.

(ii) The problem of securing interest, effectiveness and impressiveness. Motivation. Nature of interests of children and school boys. Puzzle instinct, game instinct, use of the concrete practical work, and Laboratory method. Outdoor work, Problems, exercises, their nature and use.

(iii) Empirical stage and the rational stage. Working knowledge and knowledge of principles underlying the processes. Teaching rules and general principles of solving problems. Heuristic versus Dogmatic methods ; inductive and deductive methods ; analytic and synthetic methods.

- (iv) Short and easy methods. Means of developing speed and accuracy.
- (v) Class versus individual teaching. Dalton Plan; Supervised study, assignments. Class Teaching, questioning, Oral work. Written work. Individual work, home work.
- (vi) Detailed consideration of the several topics in the Elementary and Optional Mathematics Syllabuses as to Methods of organisation and teaching.
- (vii) The medium of instruction. Text-books. Illustrative materials apparatus and appliances. Blackboard. Notes of lessons and teachers' record of work. Pupils' note-books. Mathematical laboratory and library. Pupil Associations.

#### 4. Tests and Examinations.

Sources of errors and uncertainties in setting questions and valuing answer papers. The various forms of new type tests; standard tests, their value and limitations. Treatment of errors.

Standardisation of tests. Fundamental ideas of statistical methods applied to educational problems. Statistical Data; their collection and presentation; statistical averages and correlation.

### E (e) AND SYLLABUS IN 'PHYSICAL SCIENCE AND NATURAL SCIENCE.

#### PART I—(common to both).

1. HISTORY OF SCIENCE TEACHING—Development of science teaching in Universities and Academies—The place of science in the modern curriculum of studies in schools.

2. Aims and values of Teaching Science in schools.

3. SCIENTIFIC METHOD—What is inductive and deductive thinking—Analysis and synthesis—Imaginative Hypothesis, testimony and authority—Collection of facts and data—Conclusions—Testing the validity of Scientific Theories—Application of this method to Physical and Natural Science.

4. METHODS OF TEACHING SCIENCE :—Lecture—Lecture Demonstration—Development method—Heuristic method—Problem method—Individual method—Dalton Plan—Project method—Supervised study—Application of these to the teaching of Physical and Natural Science.

5. METHODS OF TESTING :—Oral—Essay type—new types of tests. Practical Examinations. Validity, reliability and objectivity of tests.

#### PART II—(Physical Science).

1. The relation of physical science to the other subjects in the curriculum.

2. DETERMINATION OF THE CURRICULUM :—Science interest and activities of children at different levels—Popular Science—Historical considerations—Environmental conditions—Hobbies—Constructive activities—Drawing up of syllabuses, with special reference to the requirements of the local schools—General Science and specialised study.

3. AIDS TO THE TEACHING OF SCIENCE :—Text books—Laboratories—Laboratory planning and equipment, Laboratory management—preparation of indents—Workshops—Excursions and visits to works, Museums—Exhibitions—Library—Films—Optical Lanterns—Wireless—Science societies and clubs—Records and notes—Teachers' preparations—Teaching notes.

#### 4. PRACTICAL WORK :

A. The practical work will include the setting up of demonstration apparatus, the making of charts and illustrations, use of school\* and home-made apparatus, photography and preparation of lantern slides. (Wood work, metal work and glass blowing, wherever possible).

B. The course should also include an elementary knowledge of the practical work as applied to the Natural Science section of the general syllabus of the schools.

## PART II—(NATURAL SCIENCE).

1. The relation of Natural Science to the other subjects in the curriculum.

2. DETERMINATION OF THE CURRICULUM :—Courses of study—principles underlying schemes of lessons, logical, psychological and seasonal arrangements of topics—the concentric system—General Science and specialised study.

3. THE TEACHING OF NATURAL SCIENCE :—Observation and study of actual specimens and organisms in the field. The value of diagrams and descriptions by pupils—central and demonstration experiments. Relation of organisms to environment—adaptations, continuity and evolution of life—development of the type concept—Principles of classification.

4. AIDS TO TEACHING :—School garden—collection and preservation of plants and animals—Museum—Herbarium—Aquarium—Terrarium—their maintenance. Diagrams, charts, photographs, lantern slides, films—excursions, exhibitions, library, nature clubs and societies. Text-books—Laboratory planning and equipment. Laboratory management—preparation of indents—Records and notes—Teaching notes.

5. PRACTICAL WORK :—

A. This will include a detailed study of the subject matter for the different lessons in the various grades, the preparation and study of the different lessons in the various grades, the preparation and study of plant and animal specimens, the fitting up and carrying out of experiments, keeping Records, nature diaries and calendars—preparation of diagrams, charts, photographs and lantern slides; collection and preservation of plant and animal specimens for the museum and of plant specimens for the herbarium; Work in school garden; maintaining aquarium and terrarium, (Practice in wood and metal work and in glass blowing, wherever possible),

B. It should also include an elementary knowledge of the practical work as applied to the physical science section of General science syllabus of the High Schools.

## E (g) THE TEACHING OF HISTORY.

### I. THE NATURE OF HISTORY.

1. The scope and meaning of History :—(a) biographical conception (b) as record of the past. (c) Evolutionary conception—political and economic and social evolution of civilisation, (d) history as philosophy. (e) how real history transcends written history.

2. The history of History :—Evolution of the art of historical writing.

3. The Organisation of History :—Sources—their external and internal criticism—synthesis, narrative, didactic and scientific History.

4. Can History be a science?

5. The features or dimensions of History :—(a) continuity, (b) development, (c), time. (d) place.

### II. AIMS AND VALUES.

1. AIMS :—

GENERAL :—

i. Development of historical sense. Creation of interest in comprehending past and present.

ii. Securing of intelligent use of books and training in individual work.

2. VALUE OF HISTORICAL INSTRUCTION :—

(a) Cultural :—

i. Social experience and study of human nature.

ii. Breadth of outlook—International outlook and world peace,

(b) Practical.

(c) Ethical.

(d) Mental Training.

### III. THE HISTORY SYLLABUS AT SCHOOL.

1. THE CURRICULAM CONTENT OF GRADED HISTORY :—(a) biography, local history, national (Indian and British), European. Colonial and Imperial. World History including the story of ancient civilisations, (b) Chronological divisions of history—pre-history, ancient, mediaeval, modern, contemporary history and current events.

2. PROCESSES INVOLVED IN SYLLABUS CONSTRUCTION :—Principles of selection and gradation of material.

3. Teaching History backwards.

4. Civics.

5. CORRELATION WITH OTHER SUBJECTS :—The desirability of a unified social science or a Fusion Course.

6. Time allotted to history at School.

### IV. METHODS OF TEACHING HISTORY.

#### GENERAL.

1. Traditional Methods.

2. NEW LINES OF APPROACH :—To develop imagination and stimulate thought ; suggested lines of procedure :—

i. Types of Recitation :—Inductive recitation ; lecture recitation ; socialised recitation : review and drill recitation, recitation based on home study.

ii. Topical history :—Problems and Projects—tracing—logical consequences and geographical influences—proper reviews.

iii. Graphical and pictorial charts.

iv. Preparation of stories, letters, eye-witness accounts, diaries, conversations, songs, ballads, plays, pageants etc.

v. Pupil's work :—

(a) Individual :—Sources, collateral reading, essay, practical work, monthly test, note making and note-taking.

(b) Co-operate :—Lectures, discussions and debates, drama, hand-work, excursions and expeditions.

vi. Laboratory work.

3. Teacher's Self-checking in History teaching.

### V. DIVISION OF THE SCHOOL COURSE.

1. Division into (a) Primary Stage, (b) Middle School Stage, and (c) High School Stage.

2. Need for the co-ordination of these syllabuses for the three stages.

3. A specimen syllabus for each stage and the study of syllabus now in use.

### VI. TEACHING IN THE PRIMARY STAGE.

(1) Special aims, (2) Selection and gradation of material, (3) Methods of Teaching General Principles, Oral Teaching. Use of Text-books and appliances, the pupil's note-book, (4) Correlation, (5) Dramatisation, (6) Suitable excursions.

### VII. TEACHING IN THE MIDDLE SCHOOL STAGE.

(1) Special aims, (2) Matter and its organisation, (3) Methods of Organisation of material (e. g. The Concentric, Spiral, Periodic, Chronological Regressive Topical and Type Methods), (4) Methods of Teaching (Text-book, its requirements and treatment ; Chronology, Correlation, Self activity of pupils, suitable excursions).

# VIII. TEACHING IN THE HIGH SCHOOL STAGE.

1. Special Aims.
2. Matter and Method of Organising it.
3. Methods of Teaching (Oral presentation; Text-book; Multiple text-book; Collateral reading; Library equipment; the comparative, Topical, Source problem and Project Method).
4. Written Exercises.

## IX. HISTORICAL FICTION.

## X. THE MEDIUM OF INSTRUCTION IN HISTORY.

## XI. THE HISTORY EXAMINATION.

(The new types and standardised tests).

## XII. THE HISTORY TEACHER.

## XIII. THE HISTORY LIBRARY.

## E. (h) METHODS OF TEACHING GEOGRAPHY.

NOTE :— (i) While a knowledge of the general geography of the world will be expected of all students, the questions on method may bear also upon a particular topic to be prescribed each year. Suggested topics from which selection may be made are as follows :—

India—emphasising river work and irrigation; South America with special reference to climate and vegetation; the monsoon lands of Asia (other than India) with special reference to natural products; Europe—with special reference to trade and commerce; North America with special reference to the effect of relief and drainage upon communication; The Mediterranean region with special reference to land forms; Australia with special reference to the effect of climate upon settlement; the Old World Deserts with special reference to human settlement, occupations and movements.

(ii) Questions on method may require also the drawing of a sketch map for illustration in teaching.

(iii) Practical work should include the study of the locality, the making of teaching equipment, practice in the use of the black-board (particularly in developing the map as the lesson proceeds), classification and arrangement of equipment, the preparation and the giving of lessons and lantern lectures.

I. The place of Geography in education with special reference to its use in training for citizenship and in promoting international understanding.

II. The content of School Geography and its relation to other school subjects :—

(a) The selection of subject matter with reference to mathematical, physical, economic, historical and political, the geography of current events, regional including Local, Indian and World Geography.

(b) Introduction to the tools of Geography and the extent of training in the use of them in the three stages—observation and recording, maps, diagrams, statistics, etc.

## III. The Direct Study of Geography.

The observation and expression of the facts of local Geography; the possibilities and use of different environments. (This should be done through a practical study either of the student's home region or of the home region of the Training College).

## IV. Training in the use of maps, graphs and diagrams.

## A. MAPS —

- (i) Introduction to maps through the pupil's own sketch-plan of his immediate surroundings, the progression to the idea of scale and relief, the transitions, from the local map to the Atlas map, from the globe to the flat map; place of the picture map and the photo-relief map.
- (ii) Map-reading—practice in correlating maps and suitable exercises on (a) 1" and larger scale topographical maps. (b) distribution maps (climatic, economic, etc.) Characteristics and limitations of projections used in school atlases.
- (iii) Simple surveying—its value, possibilities and limitations in the school course.
- (iv) Map-expression—the importance of progressive training in drawing sketch-maps and in making maps from data supplied.

## B. GRAPHS AND DIAGRAMS :— their variety, purpose and use : the desirability of their introduction in simplified forms in the early stages.

V. The purpose, place and method of regional geography—selection of appropriate regions and methods (e. g. descriptive or systematic) for the various stages of the school course.

## VI. The scope and treatment of the following in the three stages :—

- (a) Weather and climate; maintenance of school records and use of weather reports.
- (b) Astronomical and mathematical geography.
- (c) Land forms.

## VII. Problems peculiar to the Teaching of Geography in South Indian School

1. Translation of technical terms.
2. Standards to be adopted in the spelling and pronunciation of geographical names in English and in the Indian language.
3. The regional unit; its relation to the political and administrative divisions of South India.

VIII. THE TEACHING SYLLABUS :—The necessity for a "teaching syllabus" as distinct from the School syllabus. How to plan effectively so as to secure due emphasis on (a) Observation work, (b) Regional geography, (c) Training in the use of maps etc., (d) Testing.

## IX. METHODS OF TEACHING :—

(a) The value and possibilities of the following in the three stages—geography story; description, exposition inductive and deductive method, visual illustration, individual and group methods.

(b) The organisation of the Geography lesson.

(i) the class lesson, its place in the 'lesson' unit, the use of the black-board, wall-maps, wall-pictures, the globe.

(ii) the outdoor lesson observation and expression; day excursions and the school journey.

(c) The work of pupils—the importance of the assignment; the value and use of practical note-books; the pupils' note-books, geography homework (including type of work and time allotment).

(d) Testing results—the purpose and method of testing; its use as drill; factors to be tested including (i) the knowledge of facts and locations, (ii) the exercise of geographical reasoning and the ability to apply geographical knowledge; types of tests and their value.

X. THE GEOGRAPHY ROOM AND ITS EQUIPMENT :—The necessity for a separate geography room. Minimum essentials in equipment; the classifications, storing and caring of equipment; the making of equipment—enlarging and duplicating of maps, the making of relief models, the collecting and storing of pictures,



and specimens, text-books, sources of information, atlases and reading matter suitable for each stage.

## SYLLABUS IN ARTS COURSE.

### Drawing.

#### THEORY—GENERAL LECTURES.

1. The Art of Drawing and Painting.
2. The Aims and values of teaching Drawing and Painting.
3. Natural and artificial side of drawing.
4. Materials and appliances used for drawing, and how to use them.
5. Theory of geometrical drawing and perspectives.
6. Free Arm and Ambi-dexterous drawing.
7. The place of free arm drawing in schools.
8. The art of Monochroma shading and painting.
9. Drawing in correlation with other subjects in schools.
10. A comparative study of the works of different schools of art.

#### PRACTICE.

- I. FREE ARM DRAWING ON BLACK-BOARD.
  - (a) Copying from picture-cards and charts of animals, birds, insects, etc.
  - (b) Illustrating stories and memory drawing.
  - (c) Exercises in rapid sketches, ambi-dexterous drawing of symmetrical forms and designs.
- II. FREE HAND DRAWING IN BOOKS.
  - (a) Drawing from flat examples.
  - (b) Birds and animals from stuffed specimens.
  - (c) Model drawing.
  - (d) Drawing from still life etc.
- III. SHADING.
  - (a) With crayons, stumps and powder and water colour showing gradations and tone values.
  - (b) Painting foliage and scenes with natural colours.
- IV. PENMANSHIP AND LETTERING.

## SYLLABUS IN CRAFTS FOR THE DEGREE COURSE IN EDUCATION.

### 1. THEORY.

1. The place of the crafts in an Education system.
  - (a) Creative self expression.
  - (b) Relation between Art and Craft.
  - (c) The cultural view of the crafts.
  - (d) Considerations governing the choice of a craft and the general methods by which it should be taught.
2. Crafts in the past and present life of the community.
  - (a) Pre-historic man and his development—the origin of the crafts.
  - (b) The development of the crafts in the provision of shelter clothing and domestic objects. Innate taste prompting artistic treatment of necessary objects.
  - (c) A detailed consideration of the development of the crafts.  
Architecture, Furniture, Metal work, Weaving and Embroidery costume. Domestic Textiles, Writing, Illumination and the printed books. Sculpture, Painting.
  - (d) Art and Crafts in the development of civic life.

3. Organisation and technical details, Lectures on the equipment, organisation and routine of craft classes and on tools, materials and processes to be given from time to time as a part of the practical training in each craft that is practised

4. Craft occupations and their educational values.

5. Kindergarten occupations.

6. Vocational training and vocational guidance.

7. Leisure time occupations followed scientifically.

8. Correlation of crafts with different school subjects ; how the craft training helps teacher in teaching the school subjects.

9. Selection and treatment of local materials as media.

10. Educational Museums and educational exhibitions.

## II. PRACTICAL WORK.

The Principal craft subject in A and any two of the subsidiary crafts subjects in B (as detailed below).

Or any three of the Craft subjects in B.

A. PRINCIPAL CRAFT SUBJECT : Wood work to be taught in relation to a Project.

- i. Bench work in wood fundamental exercises such as sawing, planing, smoothening, marking out, paring, boring, joining, glueing, nailing screwing dovetailing, inlaying glass papering and finishing—

TOOLS : Such as saws, planes, chisels, gouges, gauges, squares, spokeshaves, brace and bits, mallets, hammer, screw driver, etc., their parts, uses and manipulation.

- II. Design and construction of apparatus and appliances for use in the teaching of School subjects.

## B. SUBSIDIARY SUBJECTS.

- i. PAPER AND CARD-BOARD WORK. To fold various geometrical and other forms, simple designs to make small interesting objects by folding, crushing, squeezing, plating etc. To make models of useful articles from paper and card-board by drawing and developing various designs, cutting, pasting, binding, panelling, etc.

- ii. BOOK CRAFT. Book-binding, sewing on tapes and cords, flexible, sewing, half and whole binding in cloth and leather, finishing processes, lettering, blind gilt, tooling, Binding periodicals and old and torn books.

- iii. MODELLING IN CLAY OR PLASTER. To model natural and common objects, animals scenery, structures, involving the following exercises—Rotating, rolling, pressing, colouring, etc., illustrating lessons by means of clay and combination of other media.

- iv. Bead and wire work ; use of glass mirror, shell dried seeds, string, cane, raffia, pa'myra leaf, to make decorative objects.

## III. DRAWING AND DESIGN. With special reference to the particular craft to be practised.

- i. Mechanical Drawing : Projections, Orthographical (plans elevation, section development) oblique and isometric.

- ii. Nature, animal and figure drawing.

## IV. Teaching practice to be arranged whenever possible.

## SYLLABUS IN ART.

### THE NATURE OF ART.

1. The Problem of Art and Beauty.
2. The nature of Beauty.
3. Art—Beauty—Truth.
4. The Psychology of Art.
5. The use of Art.
6. Indian ideas of Art.
7. Chinese ideas of Art.

8. Western classical ideas of Art.
9. Modern Western conceptions of Art.

#### THE HISTORY OF ART.

1. Primitive Asian Architecture and Sculpture.
2. Buddhist and Hindu Architecture and Sculpture.
3. Moghal Architecture and decoration and its affinities.
4. Indian influences in Asian Architecture and Sculpture.
5. The Buddhist Frescoes and their Hindu successors.
6. The Rajput and Moghal miniature paintings and their Predecessors.
7. Chinese and Japanese painting.
8. Modern Indian painting.
9. The main features of Kerala Art.
10. The essentials of Eastern music.
11. The essentials of Western music.
12. The Oriental Drama.
13. The Occidental Drama.
14. Classical Western Architecture.
15. Modern Western Architecture.
16. Occidental Sculpture.
17. Classical Western painting.
18. Modern Western painting.

#### EXAMINATIONS IN LAW.

NOTE 1. No special text books in the case of Acts of the Indian Legislature are prescribed, but students will be expected to have a mastery of the matter which is usually contained in the best commentaries as well as a knowledge of the bare text of the Act.

2. Text books have been prescribed where necessary with a view to indicating the general scope of each subject, but questions will not be confined to the books prescribed.

#### First Examination in Law.

##### 1. JURISPRUDENCE:—

1. Salmond: Jurisprudence.
2. Maine: Ancient Law. Ed. Pollock.

##### 2. ROMAN LAW:—

1. Moyle's Translation of Justinian.
  2. Leage: Roman Private Law.
- or
- Buckland: Elements of Roman Law.

##### 3. CONTRACTS:—

1. Anson's Law of Contracts.
2. Pollock and Mulla. Indian Contract Act.
3. T. S. Venkatesa Aiyar: Law of Contracts.

##### 4. TORTS:—

1. Pollock on Torts.
2. Salmond's Law of Torts.
3. The Law of Torts by S. Ramaswami Ayyar.

##### 5. INDIAN CONSTITUTIONAL LAW:—

1. Ilbert: Government of India.
2. Cowell: Courts and Legislative Authorities in India.
3. Government of India. Acts of 1919 and 1935 and rules made thereunder.

**B. L. DEGREE EXAMINATION.**

1. **PROPERTY:—**  
Williams: Real Property.  
Strahan: Equity.
2. **HINDU LAW:—**  
Mayne's Hindu Law and Usage.
3. **MUHAMMADAN LAW:—**  
Mulla's Muhammadan Law.
4. **CRIMINAL LAW:—**  
Kenny: Outlines of Criminal Law.

NOTE. The candidates need study only the portion relating to the general principles and they may omit the special portions of the book.

Indian Penal Code.

5. **EVIDENCE:—**  
Wills on Evidence.  
The Indian Evidence Act.
6. **LAND TENURES:—**  
Soundararaj Iyengar: Indian Land Tenures.

**ORIENTAL TITLE EXAMINATIONS.****Entrance Examination in Sanskrit, 1943 and 1944.**

1. **Sahitya:—**  
(a) Naisadha, Sargas V and VI.  
(b) Harsacarita, Uchchhasas I and 2.  
(c) Sakuntala.  
(d) Sahityadarpana (omitting the Arthalankara portion) and Kuvalayananda.
2. **Vyakarana:—**  
Sidhantakaumudi, Purvardha to the end of Karakaprakarana.
3. **Tarka and Mimamsa:—**  
Muktavali—up to the end of Anunana.  
Arthasangraha.
4. **English:—**  
Detailed Text: Yates Reader (Reformed Series) No. IV. Lessons 8-9, 11, 13, 15-20, 23, 24, 26, 30, 33, 35, 40, 42-44.  
Non-detailed Text: The Golden Series. Golden Deeds of India—L. and H. G. D. Turnbull—Lessons 1, 3, 4, 6-9 and 11.

**Entrance Examination in Sanskrit, 1945.**

Same as for 1944.

**Mahopadyaya Preliminary Examination, 1943 and 1944.****TEXT BOOKS.****PART I.****GENERAL.**

- (a) 1. Visvanatha Pancanana: Muktavali with Sabdakhanda Dinakary.  
2. Apadeva: Mimamsa nyaya prakasa.  
3. Sidhantakaumudi—the whole of Uttarardha omitting Unadi, Vaidika and Svava prakaranas.
- (b) 1. Rig Veda: Macdonell's Vedic Reader—hymns I to X both inclusive, text only.  
2. Kathakopanisad: Text only.  
3. Gautama dharma Sutra: The first Prasna, text only.  
4. Yajna valkya Smriti: Vyavaharadhyaya only.

## PART II.

## SPECIAL.

## BRANCH I.

## NYAYA.

1. Kanada: Vaiseshika Sutra (whole) text only.
2. Gautama's Sutras with Vatsyayana Bhasya—Chapters I and II.
3. Jagadisa's Pancalaksani and Simha vyagri.
4. Gadadhara's Caturdasa laksani:
  - i. From the beginning of the work up to the end of Dvitiyasvalaksana.
  - ii. Kutaghatitalaksana.
  - iii. Kutaghatitalaksana.
  - iv. Vyadhikaranadharma vacchinnabhavakhandana grantha.
5. Gadadhara's Sakti vada.
6. Gadadhara's Sidhanta laksana.

## BRANCH II.

## VYAKARANA.

1. Praudha manoraina from the beginning to end of Avyayibhava.
2. Sabdaratna from the beginning to the end of stripratyaya.
3. Paribhasendusekhara (whole).

## BRANCH III.

## SAHITIYA.

- |                      |   |
|----------------------|---|
| 1. Bana              | Kadambari—to the end of sukanasopadesa. |
| 2. Sri Harsa         | Naisadha—Cantos I & II.                 |
| 3. Kalidasa          | Kumarasambhava—Cantos I to V.           |
| 4. Nilakanda Diksita | Nilakanthavijaya, Asvasas, 1 to 3 only. |
| 5. Kalidasa          | Sakuntala.                              |
| 6. Bhavabbuti        | Uttararamacarita.                       |
| 7. Sudraka           | Mrechakatika.                           |
| 8. Visakhadatta      | Mudraraksasa.                           |
| 9. Dandin            | Kavyadarsa.                             |

## BRANCH IV.

## JYOTISA.

- |                  |   |
|------------------|---|
| 1. Bhaskaracarya | Bijaganita (complete).<br>Lilavati omitting Parikarmastaka, Kuttaka and Pasa. |
| 2. Jagannatha    | Rekhaganita, Book I to VI.  |
| 3. Pancabodha    | Grahanantha omitting Sringonnati.   |
| 4. Trikonamiti.  |   |

## BRANCH V.

## VEDANTA.

## ADVAITA.

1. Brahma Sutras with Sankara Bhasya.
2. Bhamati Catussutri.
3. Pancapadika with vivarana—Varaaka I only.
4. Brhadaranyakopanisad with Sankara's Bhasya, Chapters II & III only.
5. Chandogyopanisad Sankara's Bhasya, Adhyaya VI only.
6. Mandukyopanisad with Gaudapada's Karikas and Sankara's Bhasya.
7. Bhagavatgita with Sankara's Bhasya.

## VISISTADVAITA.

1. Brahmasutras with Sri Bhasya.
2. Srutaprakasika -- Jijnasadhikarana.
3. Bhagavadgita with Ramanujas Bhasya.
1. Brahadaranyakopanisad with Rangaramanuja's Bhasya.

## DVAITA.

1. Brahmasutras with Madhavacarya's Bhasya.
2. Tattvaprasika by Jayatirtha.
3. Gitatattvaparyanirupaya with Jayatirtha's Tika.
4. Madhavabhasya on the Brhadaranyakopanisad.
5. Madhavacarya's Anuvyakhya with Jayatirtha's Nyayasudha Jijnasadhikarana only.

## BRANCH VI.

## MIMAMSA.

1. Taittiriya Samhita with Sayana's Bhasya (Kanda I, Prapathika I).
2. Aitareya Brahmana with Sayana's Bhasya (IV Pancika).
3. Apastamba's sutras with Rudradattas Vrtti Prasnas I to V (both inclusive).
4. Yajnavalkyasmriti with Mitaksara (whole).
5. Bhattadipika—Purva Satka only.

**Mahopadyaya Preliminary Examination, 1945.**

Same as for 1944 with the change that under Part II Branch III—Sahitya—Sakuntala be replaced by Anargharaghava.

**Mahopadyaya Final examination, 1943 and 1944.**

## PART I.

## GENERAL.

History of the Sanskrit Language and Literature.

For the purpose of this part, the attention of teachers is invited to the list of books recommended for study and consultation under the corresponding subjects for Branch IV B. A. (Hons.) Degree Examination.

## PART II.

## SPECIAL.

## BRANCH I.

## NYAYA.

- |               |                                |
|---------------|--------------------------------|
| 1. Udayana    | Nyayakusumanjali.              |
| 2. Gadadhara  | Avayava Pratijnanta.           |
| 3. Do.        | Samanyanirukti.                |
| 4. Do.        | Savyabhicarasamanya lakshanam. |
| 5. Do.        | Satpratipaksavibhajaka.        |
| 6. Do.        | Vyutpattivada.                 |
| 7. Do.        | Avacchedakatanirukti.          |
| 8. Khandadeva | Bhattacharya (Prathamanta).    |

## BRANCH II.

## VYAKARANA.

1. Mahabhasya Navahnika.
2. Laghusabdendusekara up to end excluding Karakaprakarana.
3. Laghu Manjusa by Nagesa (only the sections containing Subarthavicara and Namarthavicara).
4. Vaiyakaranabhushanasara. All the sections except Subarthavicara and Namarthavicara).
5. Gadadhara's Vyutpattivada.

## BRANCH III.

## SAMIITYA.

- |                       |   |
|-----------------------|---|
| 1. Sidhanthakaumudhi  | Uttarardha omitting Unadi, Vaidika and Svaraprakaranas, |
| 2. Ubdhata            | Kavyalankarasara,                                       |
| 3. Vararuci           | Prakrta prakasa,  |
| 4. Vritaratnalkara    | Chapters I to IV.                                       |
| 5. Vamana             | Kavyalankarasutra.                                      |
| 6. Anandavardhana     | Dhavanyaloka,   |
| 7. Appayya Dikshita   | Chitramimamsa,  |
| 8. Jagannatha Pandita | Rasagangadhara,   |
| 9. Mamnata            | Kavyaprakasa,   |

## BRANCH IV.

## JYOTISHA.

- |  |  |
|--|--|
| 1. Sidhanta Siromani                             | Whole.                                   |
| 2. Jatakadesa                                    | Do.                                      |
| 3. Brhajjataka                                   | Do.                                      |
| 4. Muhurta padavi                                | Do.                                      |
| 5. Jyotisa prakasa by Pro. A. R. Raja Raja Varma | Do.                                      |
| 6. Prasna Marga                                  | Do.                                      |
| 7. Surya Sidhanta                                | Do.                                      |
| 8. Aryabhatiya                                   | Do.                                      |
| 9. Jyotirgitanai                                 | Up to the end of Chandragraha nadhikara. |

## BRANCH V.

## VEDANTA.

## ADVAITA.

- (a) 1 Siddhantabindu. Whole text only.
- 2 Advaitasiddhi. Paricheda I.  
 (i) from the beginning of the work to the end of Aganabaddhoddhara.  
 (ii) Ajanavada.  
 (iii) Anirvacaniyatavada and Pariccheda II akhandarthavada.
- 3 Laghucandrika from the beginning of the work to the end of Upadhi and Akhandarthavada section.
- (b) 4 Patanjali. Yoga sutras with Bhoja vritti.
- 5 Isvarakrsna's Sankhya karikas with Gaudapada's Commentary.
- 6 Advaita paribhasa by Dharmarajadhvarin.
- 7 Yatindramatadipika by Srinivasacarya.
- 8 Dasaprakaranas by Madvacarya, omitting Karmanirnaya and Visnutattvanirnaya, text only.

## VISISTADVAITA.

- (a) 1 Vedartha Sangraha.
- 2 Siddhitraya by Yamunacarya.
- 3 Satadusani with Candamaruta—the first 15 vadas.
- 4 Nyayasiddhanjana up to the end of Budhi Pariccheda.
- (b) Same as under Advaita, Final Examination (b).

## DVAITA.

- (a) 1 Nyayamrta the first Pariccheda only.
- 2 Bhedojjivana. Vyasaraya.
- 3 Nyayamrtatarangini—the 1st Pariccheda only.
- (b) Same as under Advaita, Final Examination (b).

**BRANCH VI.**  
**MIMAMSA.**

- 1 Bhatta Dipika Uttarasetka only.
- 2 Sabara-Bhasya. Chapter I with Kumarila's Vartika, Chapter I omitting Slokavartika.
- 3 Parthasarathi Misra's Nyayaratnamala.
- 4 Bhattarahasya. (whole).

**MAHOPADHYAYA FINAL EXAMINATION—1945.**

SAME AS FOR 1944.

**SAHITYAVISARADA—1943.**

**POETRY : EARLY PERIOD.**

- (1) Ramacharitam—1 to 12 padalams.
- (2) Kannassaramayanam—Balakandam.
- (3) Unnineeli Sandesam, B. V. Book Depot, Trivandrum

**MIDDLE PERIOD.**

- (1) Krishnagatha—Vatsa steyam.
- (2) Chellur Nathodayam Champu.

**MODERN PERIOD.**

- (1) Leela by N. Kumaran Asan, Sarada Book Depot, Trivandrum.
- (2) Mahathyagi (Revised Edition) by Vidwan M. O. Avarah, Menacheri House, Koonammavoo, N. Parur.
- (3) Karnabhooshanam by Mahakavi S. Parameswara Iyer, B. V. Book Depot, Trivandrum.

**Prose.**

- (1) Bhagavatham Basha Part I. Government Press, Trivandrum.
- (2) Vartamanapustakam, First half only by Rev. Fr. Governorador.
- (3) Dharmaraja by C. V. Raman Pillai, Kamalalaya Book Depot, Trivandrum.
- (4) Sahityamalika Part I, by P. N. Kunjan Pillai, Arts' College, Trivandrum.
- (5) Thuncat Ezhuthaccan by P. K. Narayana Pillai, Sri Rama Vilasam Press, Quilon.

**GRAMMAR, HISTORY OF LANGUAGE, ETC.**

Same as for B. A. Part III, Group (iii—b) except item (2) Caldwell's Comparative Grammar.

**HISTORY OF LITERATURE.**

Same as for B. A. Part III, Group (iii-b) with the addition of Bhasha Charritram Vol. II by P. Govinda Pillai.

**ENGLISH : MACMILLAN'S NEW INDIA READERS V.**

**SANSKRIT (SUBSIDIARY.)**

1. Samskritagadyavali by Panduranga Vaman Kane (Macmillan & Co., Ltd.)
2. Samskritapadyavali by Panduranga Vaman Kane (Macmillan & Co., Ltd.)

**TAMIL (SUBSIDIARY.)**

1. Hakkia Thirathu Part II omitting the following :—  
(Poetic selections) 2, 4, 7v, 7vi, 7vii, and 9, (Prose selections) 6, 9, 12 and 16 by Bhavanandan Pillai. (Macmillan & Co., Madras.)
2. Elementary Grammar in Tamil by A. Karmeka Konar, Lecturer in Tamil, American Mission College, Madura.



### SAHITYAVISARADA—1944.

Same as for 1943 with the following changes :

- Poetry.**
1. Ramacharitam Patalams 13 to 25 instead of Patalams 1 to 12.
  2. Anyapadesa Satakam instead of Leela.
  3. Magdalanamariyam instead of Mahathyagi.
  4. Bhakti Deepika by Mahakavi S. Parameswara Aiyar, B. V. Book Depot, Trivandrum, instead of Karnabhoo-shanam.
  5. Thenkailanathodayam Champu instead of Cellurnathodayam.
- Prose.**
- (1) Vartamanappustakam, second half instead of first half.

### SAHITYAVISARADA—1945.

**Malayalam (Main) :** Same as 1944 with the additions Uttararamacearitam by Cattukutti Mannadiyar, Rukunivayamvaran Kathakali by Asvatthirunal and also with the change that Sahityamalika be replaced by Sahityahridayam by Vadakkumkur Rajarajavarma.

**ENGLISH :** Macmillan's New India Readers V.

**SANSKRIT (subsidiary) :** Same as for 1944.

**TAMIL (subsidiary) :** Same as for 1943.

### VIDVAN EXAMINATION 1943.

#### POETRY EARLY PERIOD.

1. Mullai Pattu.
2. Poems of Paranan contained in Sanga Ilakkian pp. 371 to 921 (85 stanzas) Siva Sidhanta Maha Samajam, Mylapore.
3. Purattirattu Arathupal, First 205 stanzas published by the University of Madras.

#### MEDIEVAL PERIOD.

1. Silappathikaram, Kolaikkalakkathai.
2. Jeevaka Cintamony Kovindayar Ilambakom.
3. Sulomony : Thuthu Vidu Padalom.
4. Kamba Ramayanam : Kumbakarnan Vathai Padalam.
5. Peria Puranam, Thirukkuriippu Thondar Puranam.
6. Villi Bharatham : Krishnan Thuthu Charukkam.
7. Pathinoram Thirumurai—Cheraman Perunal Nayanar Athi Ula.
8. Nalayira Thivya Prabandom : Kulasekara Alwar Perumal Thirumozhi.
9. Kalingattu Parani : From the beginning to Raja Parampariam—8 Chapters.

#### MODERN PERIOD.

1. Mathurai Kalambakom.
2. Tamil Vidu Thuthu published by Dr. V. Swaminatha Iyer, Madras.
3. Sakkilar Pillai Tamil by Meenakshi Sundaram Pillai.
4. Ramalinga Swamikal Thiru Arulpa ; VI Thirumurai ; Pillai Chiru Vinnappam and Pillai Peru Vinuappam.
5. Kalaisai Siladaj Venba, First 25 stanzas.

#### Prose

1. Iraiyanar Ahapporul Urai.
2. Vinotha Rasa Manjari First 50 pages published by S. M. Jeganatham, Nagercoil.
3. Navalur IV Balapadam.
4. Suguna Manjari by Vedanayakom Pillai, Retired District Munsiff, Mayavaram.
5. Introductions of Kalithokai and Nakkana Vilakkam, edited by Rao Bahadur Damodaran Pillai, B. A., B. L. and published by S. M. Jeganatham Nagercoil.

**Grammar.**

1. Tholkappayam Chol Athikarom Senavariyam.
2. Nannul Mylainathar's Commentary.
3. Nambi Ahapporul.
4. Purapporul Venba Malai.
5. Yapparungala Karikai.
6. Thandi Alankaram, Old Commentary.

**HISTORY OF LITERATURE.**

1. Tamil Varalaru, Parts I and II by K. Srinivasa Pillai, Tanjore.
2. Sanga Tamilum Pir-kala Tamilum by Dr. V. Swaminatha Aiyar, Madras.

**ENGLISH. MACMILLAN'S NEW INDIA READERS V.****MALAYALAM (SUBSIDIARY.)**

1. Sri Chitra Thirunal Patavali published by Government, Book No. VII. Lessons 1, 5, 6, 8, 9, 12, 14, 15, 19, 21, 22, 23 and 24.
2. Prathamavyakarana by Prof. A. R. Raja Raja Varma Koil Tampuran.

**SANSKRIT (SUBSIDIARY.)**

1. Samskratagadyavali by Panduranga Vaman Kane (Macmillan & Co., Ltd.)
2. Samskratapadyavali by Panduranga Vaman Kane (Macmillan & Co., Ltd.)

**VIDVAN EXAMINATION—1944.****POETRY.** Early Period—Same as for 1943.**POETRY.** Medieval period—Same as for 1943.**POETRY.** Modern Period.

1. Tamil Vidu Thottu.
2. Ramalinga Swamikal, Thiru Arutpa, VI. Thirumurai: Pillai Chiru Vinnappam and Pillai Peru Vinnappam.
3. Manonmoniam (Drama) (whole)
4. Iratchanniya Yathirikam by H. A. Krishna Pillai Pages 1-50 from Kadavul Valthu to the end of Suvisesamarkkapadalam.
5. Bharathy—Kannan Pattu.
6. Malarum Malaiyum by S. Desivinaiyakom Pillai.  
(a) Asia Jothi (b) Anpin Vetti (c) Parasika Kavikal.
7. Naiji Venba by K. N. Sivaraja Pillai.

**PROSE.**

1. Irayanar Ahaporul Urai
2. Vinotha Rasa Manjari  
Introduction of Kalithohai, and  
Ilakkana Vilakkam by  
Damodaram Pillai, B. A., B. L.  
Published by J. M. Jeganatham,  
Nagercoil.
3. Arputha Ulakom—P. N. Appuswamy, B. A., B. L., Mylapore, Madras.
4. Munro the Great—T. A. C. Chettiar, M. A., Lecturer in Tamil,  
Annamalai University.

**GRAMMAR.** Same as for 1943.**HISTORY OF****LITERATURE.** Same as for 1943.**ENGLISH.** Macmillans New India Readers V.**MALAYALAM—(Subsidiary)—**

1. Srichitra Thirunal Patavali published by Government. Book No. VII lessons, 1, 5, 6, 8, 9, 12, 14, 15, 19, 21, 22, 23, and 24.
2. Prathamavyakarana by Prof. A. R. Raja Raja Varma Koil Tampuran.

**SANSKRIT—(Subsidiary)—same as for Sahityavisarada, 1944.**

## VIDVAN EXAMINATION—1945.

TAMIL—(Main)—Same as for 1944.

ENGLISH—Macmillans New India Readers V.

MALAYALAM—(Subsidiary).

(1) Srikrishnacaritam Manipravalam—Sargas 1 and 2.

(2) Sanmargapradipam by Keralavarma Valia Koil Tampuran.

(3) Madhyamavyakaranam by A. R. Raja Raja Varma.

SANSKRIT—(Subsidiary) Same as for Sahityavisarada—1945.

## DIPLOMA COURSE IN TEXTILE TECHNOLOGY AND TEXTILE CHEMISTRY.

### FIRST YEAR.

#### Mathematics.

Areas and volumes of regular and irregular figures. Theory of indices and logarithms to base 10; applications.

Trigonometrical ratios; graphical determination of their values; determination of all trigonometrical ratios of an angle from any one known ratio; simple application to the solution of right angled triangles; problems in height and distances (simple cases only).

Graphs of statistical data and determination of laws therefrom.

Contracted multiplication and division.

#### Physics.

GENERAL PHYSICS AND MECHANICS.—Length, mass and time. Fundamental and Practical Units. Vernier and Screwgauge. Common Balance and Spring Balance—Laws of motion—simple applications—acceleration to Gravity—absolute and Gravity—absolute and Gravitational Units of force, work, Energy and Power Simple pendulum—Composition and resolution of forces—Couples—Centre of Gravity—Simple mechanics—Simple theorems on fluids and pressure—Archimedes' principle—Laws of flotation. Hydro-meter—Barometer—Boyle's Law. Simple forms of air pumps and water pumps—elementary ideas of surface tension and viscosity of liquids and their simple methods of measurement.

HEAT.—Mercury thermometers. Fixed points—Maximum and minimum thermometer. Expansion of solids, liquids and gases and simple methods of determining coefficients of expansion, Maximum density of water, Gas laws—Absolute temperature. Calorimetry. Method of mixture. Specific heat of solids and liquids. Laws of fusion and vaporisation. Latent heat with particular reference to water. Melting and boiling points and their methods of determination. Boiling point and pressure—saturated and unsaturated vapours. Dew point—common forms of hygrometers—Conduction, convection, and radiation. General principles of air conditioning. Mechanical equivalent of heat and its determination.

#### Practical Physics.

##### FIRST YEAR.

Vernier and Calipers, Screwgauge, Spherometer, Common Balance, Spring Balance, Density by hydrostatic Balance and specific gravity bottle, common hydrometer, Nicholson's Hydrometer, Hare's Hydrometer, Fortin's Barometer, Boyle's Law, Trolly, Parallelogram law, Law of moments, Inclined plane, Simple pendulum.

Fixed points of a thermometer, Coefficient of linear expansion, Pycnometer, Constant Volume air thermometer, Specific heat of a solid, Latent heat of fusion of ice, Latent heat of steam, Hydrometers.

#### Drawing.

Subject :— (1) Freehand Outline and Model Drawing.  
(2) Design.  
(3) Geometrical Drawing.

**(1) FREEHAND OUTLINE AND MODEL DRAWING.**

There shall be two tests in the examination each of two hours duration.

Drawing from flat example or copying : To draw in outline in pencil neatly and carefully from a given diagram illustrating some example of ornament in wood carving, stone or metal work ; or some natural object or an example of the flat treatment of ornaments in textiles, embroidery or inlay work or a piece of abstract ornament. The drawing may be on a slightly larger or smaller scale. The drawing has to be executed without the aid of any instruments such as rulers, compasses etc., space for making the drawing will be provided for in the question paper itself.

Model and object drawing :—To draw from real objects comprising a group of two or three common objects such as a basin and jug, a waste paper basket and book, bottle and book, chattee and jug, flower pot and chattee, a group of books and an ink pot and groups including models like square and hexagonal prism, cylinder and square and hexagonal pyramid, cone and sphere. The drawing should be in light and shade and in pencil, size of paper 22" X 15".

**(2) DESIGN. This should comprise two tests each of two hours duration.**

Outline Design. A. To design a diaper or repeating pattern suitable for an executive surface, such as flooring tiles, printed cloths etc.

or

To design a running pattern for borders, dados, friezes etc.

or

To make a design to fill a panel or space of any given shape and size on a given scale.

**B. Pattern Design for Textile Fabrics.**

(Time Two hours.)

WRITTEN Questions on the Theory of colours, harmony and contrast ; tone value ; proportion, balance, treatment and practical use of colouring design, various types of patterns, such as geometric, interlacing scroll, counter chain, spring and floral, the study of natural forms and colour, showing adaptations to textiles.

**(3) PRACTICAL GEOMETRY.**

Problem relating to lines, triangles, circles, arcs tangents, ellipses, similar figures, parallelograms, polygons, plain and diagonal scales and scale of chords ; construction required in geometrical pattern drawing such as simple tracing and mouldings.

Candidates will be given the option of designing for any material.

**Machine Drawing.**

Freehand sketching and preparation of drawings from models of simple mechanical details, such as bolts, nuts, studs, set screws, flanges couplings, cranks, connection rod ends, bearings, pulleys with straight and curved arms, spanners, simple riveted joints, etc.

TEXT BOOK, :—First year Engineering Drawing by Parkinson.

**Workshop Practice.**

The use of wood in pattern making, its selection, defects, treatments and weights. General use of wood working tools with particular reference to the construction of handlooms, etc. Hand and machine tools in pattern making. The use of tools in smithy and fitting shop, Production of plane surfaces by hand methods. Use of hammer, chisel and file in particular. Fitting parallel parts together. Fitting keys. Fitting and adjusting bearings. Fixing pulleys and wheels in position.

**Chemistry.****INORGANIC.**

Laws of chemical combination. Equivalent weight and atomic weights ; Valency ; Molecular weights of gases and vapours, symbols and equations.

**Periodic classification of the elements—the modern periodic table.**

Study of the following common metals and non-metals and their compounds according to groups with special emphasis on compounds used in textiles. Hydrogen, Oxygen, halogens, sulphur, nitrogen, phosphorus, arsenic, carbon, sodium, silicon, boron, potassium, ammonium, magnesium, calcium, aluminium, copper, silver, zinc, mercury, tin, lead, antimony, bismuth, chromium, manganese, iron, cobalt, nickel.

Electrolytic methods of preparation of metals, alkalis and salts.

#### **PRACTICAL.**

1. Manipulation of glass tubes and corks. Fitting up of apparatus. Study of the common burners.

2. The use of measuring vessels and the balance.

3. Purification of water by distillation, fractional and vacuum distillation.

4. Solution—the common solvents—determination of the solubility of a solid—solubility curve.

5. Density of air and carbon dioxide.

6. Density of oxygen.

7. Determination of vapour density—Victor Meyer

8. The hydrogen equivalent of the metals.

9. The oxygen equivalent of the metals.

10. Equivalent weight of carbon.

11. Preparation and properties of oxygen and hydrogen.

12. Preparation and properties of hydrogen chloride and chlorine, preparation of potassium chlorate.

13. Preparation and properties of sulphur dioxide and hydrogen sulphide.

14. Equivalent weights of acids and bases.

15. " " oxidising and reducing agents.

16. Simple volumetric estimations with standard solutions of acids, alkalis and potassium permanganate.

17. Preparation and properties of nitric acid and oxides of nitrogen.

18. Preparation of typical salts—ferrous sulphate, copper sulphate, aluminium chloride and stannous chloride.

19. Simple qualitative analysis (excluding phosphates, arsenates, chromates and insolubles) by the wet and dry methods, of substances containing not more than one acidic and basic radical.

#### **[Textile Chemistry.]**

**Textile Fibres:** General properties of textile fibres, their classifications and identification. Their microscopical appearance. The estimation of different textile fibres. Detailed study of the occurrence, physical and chemical properties of cotton, wool and silk. The artificial silks and outline of their manufacture.

**Water:** Water for industrial purposes and its purification for textile purposes.

**Sizing:** Chemistry of sizing. The object of sizing and the processes in use. The origin, composition and properties of the principal constituents of size mixing, including adhesives, softeners, deliquescents, antiseptics and weighting substances. The reasons for the use of these components with reference to the properties of the size mixing and of the sized yarn. Methods of preparing size mixings. Analysis of sized yarn.

**Bleaching:** Methods of bleaching and the principles involved. Soaps, preparation of textile soaps. Alkalies and acids and bleaching agents, organic solvents and other chemicals used in bleaching. The scouring and bleaching processes as applied to cotton materials. Damage and defects due to bleaching.

**Dyeing.** The colouring matters from the point of view of their mode of application with special reference to cotton. Mordants, assistants and their uses. Basic, direct, developed, sulphur, dyes, identification of the class of a dyestuff.

**Textile Chemistry Practice.** Practical work on the above, both in the laboratory and on a factory scale.

**Text books.** Bleaching and Dyeing of Vegetable Fibrous Materials by Hubner.

Bleaching and Finishings of Cotton by Trottmann and Thorpe.

Dyeing with Coal Tar Dyestuffs by C. M. Wittaker.

### **Cotton Spinning.**

Geographical position of the cotton fields of the world. Area where cotton can be economically cultivated. Varieties of cotton and their general characteristics. Physical conditions necessary to its growth and their influence upon the character of the fibre with special reference to Indian conditions. Spinning qualities of chief varieties of cotton. Analytical tests of spinning of Indian cottons. Waste percentages.

#### **MIXING OF COTTON.**

The methods of selecting cotton when buying. The defects usually existing and their effect upon the value of cotton. The objects of mixing of cotton and the principles of cotton mixing.

#### **BLOW ROOM MACHINERY.**

Opening, Cleaning and Scutching operations. Objects and working of different kinds of bale breakers; Different types of openers in use, Condensers, Cages and Scutchers. Recent modifications in Blow room processes, Methods of attaining uniform counts and quality.

#### **THE PRINCIPLE OF COTTON CARDING ENGINE.**

The theory of Roller and Clearer card, Revolving flat Carding engine, Waste card, Shirley card, Stripping and grinding cards. Card room management and defects in cards.

#### **CALCULATIONS.**

Relating to speed, Production and Draft. Openers and Scutcher feed motions.

Text book :—Cotton Spinning Vol. I by W. S. Taggart.

### **Weaving.**

I. Fibres used in the manufacture of Textile Yarns for weaving; different kinds of yarns used for weaving and their quality particulars; systems of numbering cotton, worsted, woollen, silk, rayon and linen. Folded, grandrelle and fancy yarns and their conversions; average and resultant counts of yarns; systems of counting reeds and healds; preparation of threads for weaving.

II. Winding mechanism of vertical grey warp winding machines; mangle wheel and heart cam traverse; mechanism for bottle shaped winding drum winding machines; weft winding mechanism of cup pirn winder, cone pirn winder, disc winder and high speed universal pirn winder; Warping; hand method of warping mill sectional, beam and high speed warping.

III. Hand loom and its parts—principles of drafting, treadling and tie up.

IV. Fabric structure and analysis; colour effects, construction of standard weaves including plain, twill, satin and their derivatives. Cloth particulars.

V. Weaving practice; Instruction and practice in the preparation of threads for weaving and winding; loom fitting. Practical weaving on hand and Power looms.

Text books : Mechanism of Weaving by T. W. Fox.

Textile Design—pure and applied—by T. W. Woodhouse and T. Milne.

Grammar of Textile Design by Nisbet.

**SECOND YEAR.****Mathematics.**

Manipulation and evaluation of complicated Engineering formulae.

Trigonometrical functions of compound angles, addition theorems. Simple cases of solution of triangles. Construction of alignment charts.

Equations to curves and forms of graph corresponding to equations.

Binomial theorem for the positive integral index. Rates of increase ; differential coefficients ; differentiation of  $X^n$  and application to problems in maxima and minima ; Calculations in yarns and fabrics.

**Physics.**

**MAGNETISM AND ELECTRICITY.** Magnets and laws of magnetic action. Permanent and temporary magnetic field. Simple magnetometers for comparing field strengths and magnetic moments. The common type of cells and their chemical action and characteristics. General ideas of E. M. F., current and Resistance and their practical units. Ohm's Law. Resistances in series and parallel. Specific resistance. Joule's Law. Ammeter and Voltmeter, and their mode of construction and use. Laws of Electrolysis and their applications. Storage cell, its theory and use.

**ELECTROMAGNETIC MACHINERY.** The Experimental study of the Laws of Electromagnetic induction. Their application to Dynamo, Motor and Induction Coil. Alternating currents. Transformers.

**\*THERMO-DYNAMICS.** Isothermal and adiabatic changes. First and second laws of Thermodynamics. General ideas regarding the cycle of operations in steam engines and internal combustion engines. Efficiency Refrigerators.

**OPTICS.** Laws of illumination. Photometry. Laws of reflection, refraction and dispersion. Visible spectrum colour and colour mixing.

**TEXT BOOK.** A Text Book of Physics by Duncan and Starling (Macmillan).

**Practical Physics.**

Surface tension by capillary elevation ; Viscosity by capillary flow ;  $J$ —by friction cone ; Magnetometer ; Tangent galvanometer and copper Voltmeter ; Metre Bridge ; Post Office Box ; Potentio meter ; Verification of Joule's Law.

Photometer ; Optical Bench measurements with lenses ; Refractive index Spectrometer.

The Practical Course for the Textile Certificate students for the second year will comprise elementary experiments in magnetism, electricity and optics only.

**Electro-technics.**

General principles of electro-magnetism. Electro-magnetic units and theory. Dynamos. Motors, motor generators and boosters, Inductive circuits and alternating currents. Measuring instruments and testing. Generating stations, distribution and transmission of power. Indoor wiring. Electric bells, telegraphs and telephones.

**TEXT BOOK :** Technical Electricity by Davidge and Hutchinson.

**Machine Drawing.**

Detailed drawing from general arrangements. Preparation of complete drawings from advanced examples.

**Chemistry.**

**PHYSICAL CHEMISTRY.** Gas laws, kinetic theory of gases, osmotic pressure, determination of molecular weights of dissolved substances ; dissociation and association ; partition coefficient. Thermochemistry.

**Law of mass action and chemical equilibrium.** Electrolysis and electrolytic dissociation. Applications—electroplating, electrotyping.

Colloids, absorption.

**ORGANIC CHEMISTRY.** Methods of purification and tests for purity. Detection of elements; ultimate analysis; formulae; isomerism.

Hydrocarbons of the methane series (methane, ethane) Homologous series  
Ethylene, acetylene.

Methyl, ethyl, propyl and butyl alcohols.

Ethyl chloride and iodide; chloroform and iodoform.

Aldehydes and ketones formaldehyde, acetaldehyde, acetone.

Fatty acids—formic and acetic.

Acid chlorides, anhydrides and amides of acetic acid.

Halogen substitution products—chloracetic and aminoacetic acid.

Esters—ethyl acetate, nitrate, sulphate.

Fats and oils, glycerol, soaps, lactic, oxalic tartaric and citric acids.

Amines, urea.

Carbohydrates glucose, fructose, cane sugar, starch, cellulose.

Benzene, toluene, and other homologues.

Halogen, nitro, amino, and sulphonic derivatives.

Phenols, benzaldehyde benzoic acid.

The diazo-reaction and azo-dyes.

Naphthalene and its hydroxy, nitro, amino, and sulphonic derivatives.

Anthracene, anthraquinone and hydroxy-anthraquinone dyes.

A comprehensive study of dyes in general and colour and chemical constitution.

### Practical.

**A. QUALITATIVE ANALYSIS**—of simple substances including arsenates, phosphates, chromates and insolubles.

**B. VOLUMETRIC ANALYSIS.** (standard solutions to be provided.)

1. Estimation of sod : hydroxide, sod : carbonate and ammonium hydroxide by titration with standard hydrochloric acid.
2. " ammonium salts.
3. " calcium (acidimetric.)
4. " iron (ferrous and ferric) with Pot : permanganate.
5. " Calcium and lead " "
6. " Sodium nitrite " "
7. " Iron (ferric) with Pot : dichromate
8. " Iodine with sod : thiosulphate
9. " Copper sulphate "
10. " Pot : Permanganate "
11. " Pot : Dichromate with sod : thiosulphate
12. " Bleaching power "
13. " Alkali sulphites and sulphides with iodine
14. "  $\text{As}_2\text{O}_3$  and  $\text{Sb}_2\text{O}_3$  with iodine
15. " Chloride with silver nitrate
16. " Silver with standard thiocyanate
17. " Hardness of water

**C. GRAVIMETRIC.**

Estimation of sulphate and chloride.

**D. ORGANIC.**

1. Detection of elements in organic compounds.
2. Detection of radicals in organic compounds.
3. Four typical preparations of organic compounds.



## Textile Chemistry

**BLEACHING.** The machinery used for desizing, kier boiling, scouring and bleaching operations.

**DYEING AND PRINTING.** A detailed study of the portions in first year with the addition of Acid dyes. Vat dyes, Naphthols, solubilised vat colours e.g. indigosols and soledons, ingrain dyes of fast red series and special dyes for cellulose acetate. Various types of machines and appliances employed for dyeing cotton, yarn in the hanks, cops, warps and piece goods. Theories of dyeing. The mineral pigments and mordant dyes. Aniline Black. Natural colouring matters. Principles involved in the dyeing of unions. Damages and defects in dyed goods. Methods of estimating dye stuffs.

## Cotton Spinning.

**Principles of Drafting.** The use of Draw frames and Speed frames for making-up rovings. Theory of epicyclic train of wheels and Differential motions. The winding mechanism of the fly frame and construction of cone drums. Calculations of the gearing, speeds production and efficiency of the machines. The ring frame. Theory of winding and twisting. Application of High Draft system. Weighting of rollers.

## Cotton Weaving.

**Power Loom mechanism** for plain, twill and satin weaves. Shedding motions : the types of tappets in general use and the purpose of different tappets' Overpick motion ; beating up and movement of the slay. Let off motions. Take up and wett fork motions.

Calculations for preparing yarns for weaving of grey and coloured fabrics. Theory and mechanism of sizing ; hank sizing, Yorkshire dressing, slasher-sizing.

Fabric structure and analysis ; construction of diamond, honeycomb, huckaback and similar weaves. Crepes ; mocklenoes, bedford cords, piques, particulars and analysis of fabrics of the course and their quantitative calculations.

**Weaving Practice :** Tuning and fixing of various parts of the power loom. Instruction and practice on warping machines. Exercises in tappet laying, lag-pegging and gaiting of power looms. Two cloth samples to be prepared from the selected weaves of the course and a complete report to be drawn upon the samples prepared.

Mechanical fittings.

**Text Books :** First year Cotton Weaving by Taylor.

**The Economics of Cotton industry and Trade :** Growth of the Cotton Industry. Changes in its organisation. Relative importance of the important cotton manufacturing countries of the world. Cotton manufacturing in India. Import and export trade. The hand-loom industry.

**Purchase of raw cotton.** Cotton markets and dealings in cotton. Price variations and their causes. Futures, Hedgings, Marketing of yarn and fabrics.

## THIRD YEAR.

## Industrial Economics.

**Labour organisation :** Industrial legislation. Organisation of capital. International relations of labour and capital. Problems connected with the relations of capital, labour and the State. The launching of an industrial enterprise; Factory planning and organisation. Departmental functions. Purchase and control of raw materials. Wage systems. Welfare work. Location of industries. Principle of management ; scientific management. Departmental relations. Mass production. Standardisation and equipment. Practice instructions, Records. Book-keeping and office organisation. Contracts. Advertising and accounting. Outline of engineering organisation, Planning, processing. Standard times of

machine and hand operation. Labour remuneration. Graphical and statistical control. Inspection. Selection and training of employees. Establishment charges. Allocation according to percentage, hourly rate, departmental and machine rate methods. Depreciation of buildings and plant. Maintenance. Reserve. Insurance and compensation. Railway and shipping rates. Financial organisation. Partnerships. Conditions of contracts. Specifications. Inland and foreign bills. Banking operations.

TEXT BOOK. Engineering Economics by Burnham.

### Descriptive Engineering.

Steam and its properties. Generation of steam, boilers, economisers, superheaters. The reciprocating steam engine Condensers. Water turbines. Steam turbines, Gas engines. Producer gas engines. Oil engines. Pressure indicators and indicator diagrams. Tests for I. H. P. and B. H. P. and mechanical efficiency, Power transmission and power cost.

TEXT BOOK. Heat Engines by Wilkins.

### Chemical Engineering.

Materials used in chemical plant construction. Principles of heat transmission and of the flow of liquids. Measurement and control of temperature. Methods of heating and cooling. Storage and transportation of solids, sludges liquids and gases. Unit types of plants employed. Agitation, distillation, evaporation, concentration, pumping, filtration, drying, pulverising, mixing, etc.

TEXT BOOK. An Introduction to Chemical Engineering by A. F. Allen.

#### DYE CHEMISTRY.

TEXT BOOK. Synthetic dyestuffs By Cain and Thorpe.

#### THEORY.

HISTORICAL INTRODUCTION: Tar distillation: Coal tar primaries, Intermediates. The general chemical operations of colour works such as nitration, sulphonation, chlorination, oxidation, reduction, alkylation, diazotisation and alkali fusion. A study of typical intermediates obtained by the above process. The manufacture, properties and chemical constitution of typical colouring matters of the following groups: Nitro, nitroso, azo, stilbene, pyrazoline, diphenyl methane, triphenyl methane, xanthene, acridine quinoline, thiazole, indamines, indophenols, azine, azonin, oxaline aithzine, sulphide hydroxylactone, hydroxyquinone, anthraquinone, and indigo. Recent developments in the use of coal tar colours.

(Pages 1 to 204.)

ANALYSIS OF DYE-STUFFS: Methods 334 to 384.

PRACTICAL. Pages 235 to 299.

#### A. PREPARATION OF THE FOLLOWING INTERMEDIATES.

1. P-nitroacetanilide and P-nitraniline.....Nitration.
2. Benzidine from nitrobenzene.....Reduction.
3. Naphthiomonic acid or Anthraquinone  
Sulphonic..... Sulphonation.
4. Anthraquinone ... .. Oxidation
5. B-naphthol .. .. Alkali fusion

#### B. PREPARATION OF THE FOLLOWING DYES.

1. Orange 11, Fast red B. or Fast red A. Azodye
2. Aniline blue, Alkali blue, soluble  
blue Triphenyl  
methane.
3. Fluorescein .. .. Do.
4. Methylene blue.
5. Safranine.
6. Primuline.
7. Indigo.

#### C. Analysis: TRITRATION WITH TITANOUS CHLORIDE.

**SPINNING.** Mechanism of silver lap machines and Ribbon lap machines. Principles and objects of combing. The Heilmann and Nasmith type of Comber.

**MULE SPINNING.** Principles and objects of mule spinning. Winding and twisting.

**DOUBLING MACHINES.** Theory of doubling and various types of machines used. Wet and dry system. Arrangement of creeds, troughs and building motion.

**THE FINISHING AND MAKING-UP OF YARNS.** Reeling and bundling machines. General outline of waste spinning machinery.

**SPINNING PRACTICE.** Sampling of cotton—Demonstration of the working of the machine explained in the lectures. Practice in adjusting the machines for different classes of cotton and different counts of yarns. Erection of machines and practise in adjusting the parts of the mechanism for different classes of cotton and counts of yarn. Testing of cotton laps, silver and rovings in order to determine the difference between the actual and calculated results. Testing silver, roving and yarn.

**TEXT BOOK.** Cotton Spinning Vols. II & III by W. S. Taggart.

**WEAVING.** Calculations for preparing yarn for grey, coloured and fancy goods. Positive tappet shedding-woodcraft, oscillating and scroll tappets. Dobby mechanism Single-lift bottom closed shed; single lift centre-shed. Positive and negative dobbies. Double lift, single jack, single cylinder open shed and black-burn semi-open shed dobbies. Underpick motion weft fork, motions centre shedding and terry reed centre motions. Jacquard harness Building. Card-cutting and cardlacing manual and mechanical. Looms for special fabrics as gauze, lappet, Madras Muslim quiltings, tapestries, pick-at will, special box motions. Other loom devices.

Automatic cross border dobbie and multiple box motions. Single and Double lift Jacquards Power consumption. Cross Border Jacquards;

Fabric structure and analysis; Terry pile fabrics. Extra warp and extra weft figuring. Plain and fancy repps. Warp and weft backed fabrics. Plain and fancy double cloths. Leno and gauze weaves.

### Textile Technology.

Testing appliances. Fabrics—stapling of fibres; microscopical examination of fibres. Testing of yarns. Testing for counts, strength, elasticity, twist, regularity, moisture and cleanliness.

Comparison of the strength of threads as shown by lea, single thread ballistic and other cloth tests. Testing of fabrics; for quality, material used, balance of structure, weave, shrinkage, strength of threads, twist and moisture. Quantitative and qualitative analysis of mixed yarns and fabrics. Determination of grey particulars from dyed, bleached and finished fabrics. The effect on the appearance and strength of the cloth due to alterations in structure. The effect of twist, high and low temperatures and moisture on the strength and appearance and the behaviour of the threads and fabrics.

**WEAVING PRACTICE:** Timing and fixing of various parts of tappets and dobbies, weaving practice in the designs of the course. Tinning and fixing of box-motions. Planning of tie ups and working of designs. Practical work on jacquard machine, fitting, card cutting and lacing. Weaving of two designs made in the Designing course.

**MILL PLANNING:** Principles underlying the design of buildings. Selection and arrangement of machinery; calculations relating to wages and costing of yarn. Preparation of financial statements relating to working of cotton spinning and weaving Mills. Weaving Mill Planning. Its organisation and costing. Weaving mill organisation. The selection, arrangement, production and weaving machinery. Equipment suitable for plain colour and fancy goods. Wages cost and Mill books.

**CLOTH DESIGNING.** Elements and principles of ornament. Influence of material and structure upon ornament. Planning various types of ornaments. Preparation of painted sketches for textiles. Treatment of natural and conventional forms. Adaption of designs. Economical distribution of colours in a design. Limitation on the choice of colours in a design. Limitations in the choice of colours imposed by weaving and commerce.

**Text Books :** Vide second year.

Textile Design and colour by Waston.

## **DIPLOMA COURSE IN TEXTILE TECHNOLOGY AND TEXTILE CHEMISTRY.**

TO COME INTO FORCE FROM THE EXAMINATIONS OF 1945

**FIRST YEAR.**

### **Mathematics.**

Areas and volumes of regular and irregular figures. Theory of indices and logarithms to base 10 ; applications.

Trigonometrical ratios, graphical determination of their values ; determination of all trigonometrical ratios of an angle from any one known ratio ; simple application to the solution of right angled triangles ; problems in heights and distances (simple cases only.)

Graphs of statistical data and determination of laws therefrom.

Contracted multiplication and division.

### **Physics.**

**GENERAL PHYSICS AND MECHANICS.** Length, mass and time. Fundamental and Practical Units. Vernier and Screwgauge. Common Balance and Spring Balance—Laws of motion—simple applications—acceleration to Gravity—absolute and Gravitational Units of force, work, Energy and Power—Simple pendulum—Composition and resolution of forces—Couples—Centre of Gravity—Simple mechanics—Simple theorems on fluids and pressure—Archimedes' principle—Laws of flotation. Hydro-meter—Barometer—Boyle's Law. Simple forms of air pumps and water pumps—Elementary ideas of surface tension and viscosity of liquids and their simple methods of measurement.

**HEAT.** Mercury thermometers. Fixed points—Maximum and minimum thermometer. Expansion of solids, liquids and gases and simple methods of determining coefficients of expansion, Maximum density of water, Gas laws—Absolute temperature. Calorimetry. Method of mixtures. Specific heat of solids and liquids. Laws of fusion and vaporisation. Latent heat with particular reference to water. Melting and boiling points and their methods of determination. Boiling point and pressure saturated and unsaturated vapours. Dew points—Common forms of hygrometers—Conduction, convection and radiation. General principles of air conditioning. Mechanical equivalent of heat and its determination.

### **Practical Physics.**

#### **FIRST YEAR.**

Vernier and Calipers, Screwgauge, Spherometer, Common Balance, Spring Balance, Density by hydrostatic balance and specific gravity bottle, common hydrometer, Nicholson's Hydrometer, Hare's hydrometer, Fortin's Barometer, Boyle's Law. Trolley. Parallelogram law. Law of moments, Inclined plane, Simple pendulum.

Fixed points of a thermometer, Coefficient of linear expansion, Pyknometer, Constant Volume air thermometer, Specific heat of a solid, Latent heat of fusion of ice, Latent heat of steam, Hygrometers.

### Drawing.

Subjects:— (1) Freehand Outline and Model Drawing.

(2) Design.

(3) Geometrical Drawing.

#### (1) FREEHAND OUTLINE AND MODEL DRAWING.

There shall be two tests in the examination each of two hours duration.

**Drawing from flat example or copying.** To draw in outline in pencil neatly and carefully from a given diagram illustrating some example of ornament in wood carving, stone or metal work or some natural object or an example of the flat treatment of ornaments in textiles, embroidery or inlay work or a piece of abstract ornament. The drawing may be on a slightly larger or smaller scale. The drawing has to be executed without the aid of any instruments such as rulers, compasses etc., space for making the drawing will be provided for in the question paper itself.

• **Model and object drawing:—**To draw from real objects comprising a group of two or three common objects such as a basin and jug, a waste paper basket and book, bottle and book, chalice and jug, flower pot and chalice, a group of books and an ink pot and groups including models like square and hexagonal prism, cylinder and square and hexagonal pyramid, cone and sphere. The drawing should be in light and shade and in pencil, size of paper 22" X 15".

(2) **DESIGN.** This shall comprise two tests each of two hours duration.

**Outline Design.** A. To design a diaper or repeating pattern suitable for an executive surface, such as flooring tiles, printed cloths etc.

or

To design a running pattern for borders, dados, friezes etc.,

or

To make a design to fill a panel or space of any given shape and size on a given scale.

#### B. Pattern Design for Textile Fabrics

(Time—Two hours.)

**WRITTEN Questions** on the Theory of colours, harmony and contrast; tone value; proportion, balance, treatment and practical use of colouring design, various types of patterns, such as geometric, interlacing scroll, counter chain, spring and floral, the study of natural forms and colour, showing adaptations to textiles.

#### (3) PRACTICAL GEOMETRY.

Problem relating to lines, triangles, circles, arcs, tangents, ellipses, similar figures, parallelograms, polygons, plain and diagonal scales and scale of chords; construction required in geometrical pattern drawing such as simple tracing and mouldings.

Candidates will be given the option of designing for any material.

### Machine Drawing.

Freehand sketching and preparation of drawing from models of simple mechanical details, such as bolts, nuts, studs, setscrews, flanges couplings, cranks, connection rod ends, bearings, pulleys with straight and curved arms, spanner, simple riveted joints, etc.

**TEXT BOOK:—**First year Engineering Drawing by Parkinson.

### Workshop Practice.

The use of wood in pattern making, its selection, defects, treatments and weights. General use of wood working tools with particular reference to the construction of handlooms, etc. Hand and machine tools in pattern making. The use of tools in smithy and fitting shop, Production of plane surfaces by hand methods. Use of hammer, chisel and file in particular. Fitting parallel parts together. Fitting keys. Fitting and adjusting bearings. Fixing pulleys and wheels in position.

## Chemistry.

### INORGANIC.

Laws of chemical combination. Equivalent weight and atomic weights; Valency; Molecular weights of gases and vapours, symbols and equations.

Periodic classification of the elements—the modern periodic table.

Study of the following common metals and non-metals and their compounds according to groups with special emphasis on compounds, used in textiles. Hydrogen, Oxygen, halogens, sulphur, nitrogen, phosphorus, arsenic, carbon, sodium, silicon, boron, potassium, ammonium, magnesium, calcium, aluminium, copper, silver, zinc, Mercury, tin, lead, antimony, bismuth, chromium, manganese, iron, cobalt, nickel.

Electrolytic methods of preparation of metals, alkalies and salts.

### PRACTICAL.

1. Manipulation of glass tubes and corks. Fitting up of apparatus.
- Study of the common burners.
2. The use of measuring vessels and the balance.
3. Purification of water by distillation, fractional and vacuum distillation.
4. Solution—the common solvents—determination of the solubility of a solid—solubility curve.
5. Density of air and carbon dioxide.
6. Density of oxygen.
7. Determination of vapour density—Victor Meyer.
8. The hydrogen equivalent of the metals.
9. The oxygen equivalent of the metals.
10. Equivalent weight of carbon.
11. Preparation and properties of oxygen and hydrogen.
12. Preparation and properties of hydrogen chloride and chlorine, preparation of potassium chlorate.
13. Preparation and properties of sulphur dioxide and hydrogen sulphide.
14. Equivalent weights of acids and bases.
15. „ „ oxidising and reducing agents.
16. Simple volumetric estimations with standard solutions of acids, alkalies and potassium permanganate.
17. Preparation and properties of nitric acid and oxides of nitrogen.
18. Preparation of typical salts—ferrous sulphate, copper sulphate, aluminium chloride and stannous chloride.
19. Simple qualitative analysis (excluding phosphates, arsenates, chromates and insolubles) by the wet and dry methods, of substances containing not more than one acidic and basic radical.

### Textile Chemistry.

The classification of fibres according to their origin, structure and economic use. A detailed account of the isolation and purification of the following fibres i. e., cotton, linen, ramie kapok, coir, jute, hemp, wool and mohair silk. Physical properties of the above fibres including their microscopical appearance, morphology, electrical and thermal conductivity, elasticity etc. The action of mineral acids, organic acids, strong and mild alkalies, influence of air and water at low and high temperatures, of reducing and oxidising agents and salts which on hydrolysis give acidic and alkaline reaction. The principle of mordanting, and the action of dyes in general. The above study includes processes such as carbonisation, chlorination, felting, conditioning regain etc. The chemical constitution of the above fibres and their identification.

The natural source of water and water for industrial purposes. Methods of softening water, determination of the hardness of water, Patersons and Permunit water softners. Difficulties caused by hard water in bleaching, scouring and dyeing.

**PRACTICAL.**

The use of the microscope, its parts and adjustments. The use of Twaddells and Beaume hydrometer and its advantage in factory. Purification of common stores material. Examination and sketching of structure of cotton, dead cotton, mercerised cotton, jute, flax, hemp, coir, artificial silk, silk and wool. Action of cold water, hot water, concentrated and dilute mineral acids, organic acids, and alkalies on the above fibres. Action of heat, mild alkalies and soaps on the fibres. Action of different classes of dye stuffs on the fibres. Action of picric acid, Millon's reagent, zinc chloride, phloroglucinol, aniline sulphate, Schwenzers reagent, lead acetate, copper sulphate and similar reagents on the fibres. Reactions of protein fibres. Estimation of hardness in water and experiments to show the defects of using hard water in bleaching and scouring operations, and for steam raising purposes. Soap formation and making of typical soap for textile industry. Reactions of soap solutions and their properties. Estimation of the detergent properties of soap solutions by the drop number apparatus and titer value determination.

**DYEING-THEORY.**

Classification of dye stuffs according to the method of application, Correction of water before dyeing and the preparatory treatment of goods before dyeing. The auxiliaries used in dyeing and the object of each. Dyeing of direct colours on cotton, wool, silk and other fibres. General characteristic properties and method of application of direct, developed, sulphur basic, janus and acid colours on different fibres. After treatment of dyed fabric with various assistants. Mordants and their uses. Identification of the above dyestuffs.

**PRACTICAL.**

Experimental dyeing to show the general methods of dyeing of direct colours with various assistants. The dyeing of direct colours on cotton, wool and silk with different percentage of shade. Effect of after treatment with copper sulphate, potassium dichromate and the mixed after treatments with chromium salts, formaldehyde, etc. Dyeing of primuline and after treatment with bleaching powder etc., Diazotising and developing with L. B. naphthols and other developers. Coupling with diazotised para nitraniline. Topping of colours. Dissolving of sulphur on colours. Effects in the percentage of sodium sulphide. Dyeing of cotton with sulphur colours. Topping of sulphur colours with basic dye stuffs. After treatments with salts of calcium, barium and strontium. Testing of the fastness of dyed goods to light, wash, perspiration and domestic chemicals. Method of application to wool and silk. Mordanting of cotton for dyeing with basic colours and methods of fixing them. Basic colours on silk and wool. Janus colours and their application on union dyeing. Mixtures of colours for complimentary shades.

Text books. Bleaching and Dyeing of Vegetable Fibrous Materials by Hubner.

Bleaching and Finishings of Cotton by Trottman and Thrope.

Dyeing with Coal Tar Dyestuffs by C. M. Wittaker.

**Textile Technology.****COTTON SPINNING.**

(A) GENERAL :—Geographical position of the cotton fields of the world ; varieties of cotton and their general characteristics ; physical conditions and its influence upon the growth and quality of fibre, with special reference to Indian conditions ; general procedure of cultivation and harvesting cotton, acreage ; damage to crops and yield per acre referring to India ; spinning qualities of chief varieties of cotton ; waste percentages ; counts and classes of yarn produced in Indian mills ; normal prices and markets of Indian yarn. Methods in selecting cotton while purchasing ; defects usually seen and their effects on the value of cotton.

(B) **GINNING AND BAILING.** Different kinds of gins and principles in their working. (roller gins ; saw gins ;) common faults in ginning, packing etc., consequent effect in market values and spinning properties ; malpractices and damping and their influences.

(C) **MIXING.** Principles and objects of mixing. Different methods of mixing adopted in cotton mills and their comparative merits.

(D) **Blow-Room.** Principles involved in the use of different blow-room machines ; working and objects of different kinds of bale-breakers ; hopper feeders, openers ; recent modifications in blow room processes and types of machines used to suit different cottons and counts, different kinds of grids, dust-trunks, cages, feed-regulating motions and beaters etc., introduced in blow room machines ; gauges and speeds kept for various counts and classes of cotton ; common defects and remedies.

(E) **CARD-ROOM.** Development of carding engine. Analytical study of different carding engines for waste and fine spinning (roller and clearer card ; flat card ; Shirely card) ; objects of grinding, stripping, and burnishing of cards ; different grinders and their merits ; systems of dressing and clothing the card cylinders ; various types of card filleting ; setting and Gauges at various points for different counts and cottons. Common defects. Card Room management.

(F) **CALCULATION.** Relating to speed, production draft, hank etc., in different machines in blow-room and carding engines ;

(G) **PTACTICAL.** Testing the cotton for quality and laps for hanks, practical work in adjusting the parts of the previous machines for different cottons and counts ; demonstrating the working of the machines.

TEXT BOOK :—Cotton Spinning by W. S. Taggart Vol. I.  
Do. by Thomas Thornley.

#### WEAVING.

(A) **General.** Short history of hand and power loom weaving ; various fibres used for yarn for weaving ; different kinds of yarn and their qualities ; methods of ornamenting fabrics ; twisted, fancy and Grandrelle yarns ; different types of reeds and healds used in weaving. History of carpet making.

(B) **PREPARATORY PROCESSES.** Objects and different systems of preparatory processes and their merits ; analysed study of different twist and weft winders ; mangle wheel and heart cam system of traverse ; high speed universal West winding machine ; warping methods of H. L. Weavers ; detailed study of beam warping, sectional warping, Vertical Mill warping and beaming on machines etc., and their merits.

(C) **POWER AND H. LOOMS.** Frame and pit looms and their merits ; fly shuttle and throw shuttle loom weaving, pattern making by tying and treddling ;

Different sheds formed ; tappets for plain, twill and satin weaves ; different types of negative tappets ; positive and negative tappets ; over and under pick motions ; analysed study of different parts of powerlooms such as weft-fork, reed motions ; picking ; beating ; shedding etc ; let off motions ;

(D) **DESIGNING.** Design paper and its use. Fabric structure and analysis of fabrics ; construction of standard weaves such as plain, twill, satin and their derivatives ; elements and principles of ornamentation ; influence of materials and their structure upon ornament ; adaptation of designs.

(E) **CALCULATION.** Systems of numbering cotton, worsted, woolen, silk, rayon and folded yarns ; various systems of (numbering) reeds and healds.

(F) **PRACTICAL.** Practical hand-loom weaving in standard weaves ; practice in winding and warping, beaming drafting, reeding and pieceing ups. Hand-loom fitting and adjustment of parts.

**SIZING.** Chemistry of sizing ; objects of sizing and processes in use ; analysis of sized yarn ; properties of the principal constituents of size mixing, including adhesives, softeners, deliquescents, antiseptics and weighting substances, methods of preparing the size mixing.

TEXT BOOK :—Weaving Mechanism by T. W. Fox,  
Grammar of Textile Design by Nisbet.



**SECOND YEAR.****Mathematics.**

Manipulation and evaluation of complicated Engineering formulae.

Trigonometrical functions of compound angles, addition theorems. Simple cases of solution of triangles. Construction of alignment charts.

Equations to curves and forms of graph corresponding to equations.

Binomial theorem for the positive integral index. Rates of increase; differential coefficients: differentiation of  $X_n$  and application to problems in maxima and minima; Calculations in yarns and fabrics.

**Physics.**

**MAGNETISM AND ELECTRICITY.** Magnets and laws of magnetic action. Permanent and temporary magnetic field. Simple magnetometers for comparing field strengths and magnetic moments. The common type of cells and their chemical action and characteristics. General ideas of E. M. F., current and Resistance and their practical units. Ohm's Law. Resistances in series and parallel. Specific Resistance. Joule's Law. Ammeter and Voltmeter, and their mode of construction and use. Laws of electrolysis and their applications. Storage cell, its theory and use.

**ELECTROMAGNETIC MACHINERY.** The Experimental study of the Laws of Electromagnetic induction. Their application to Dynamo, Motor and Induction Coil. Alternating currents. Transformers.

**THERMO-DYNAMICS.** Isothermal and adiabatic changes. First and second laws of Thermodynamics. General ideas regarding the cycle of operations in steam engines and internal combustion engines. Efficiency Refrigerators.

**OPTICS.** Laws of illumination. Photometry. Laws of reflection, refraction and dispersion. Visible spectrum colour and colour mixing.

**TEXT BOOK.** A Text book of Physics by Duncan and Starling (Macmillan).

**Practical Physics.**

Surface tension by capillary elevation; Viscosity by capillary flow;  $J$ —by friction cone; Magnetometer; Tangent galvanometer and copper Voltmeter; Metre Bridge; Post Office Box; Potentiometer; Verification of Joule's Law.

Photometer; Optical Bench measurements with lenses; Refractive index—Spectrometer.

The Practical Course for the Textile Certificate students for the second year will comprise elementary experiments in magnetism, electricity and optics only.

**Electro-technics.**

General principles of electro magnetism. Electro magnetic units and theory. Dynamos. Motors, motor generators and boosters. Inductive circuits and alternating currents. Measuring instruments and testing. Generating stations, distribution and transmission of power. Indoor wiring. Electric bells, telegraphs and telephones.

**TEXT BOOK.** Technical Electricity by Davidge and Hutchinson.

**Machine Drawing.**

Detailed drawing from general arrangements. Preparation of complete drawings from advanced examples.

**Chemistry.**

**PRACTICAL CHEMISTRY.** Gas laws, kinetic theory of gasses, osmotic pressure, determination of molecular weights of dissolved substances; dissociation and association; partition coefficient. Thermochemistry.

**Law of mass action and chemical equilibrium. Electrolysis and electrolytic dissociation. Applications—electroplating, electrotyping.**

**Colloids, absorption.**

**ORGANIC CHEMISTRY.** Methods of purification and tests for purity. Detection of elements, ultimate analysis; formulae; isomerism.

**Hydrocarbons of the methane series (methane, ethane) Homologous series—**

Ethylene, acetylene.

Methyl, ethyl, propyl and butyl alcohols.

Ethyl chloride and iodide; chloroform and iodoform.

Aldehydes and ketones formaldehyde, acetaldehyde, acetone.

Fatty acids—formic and acetic.

Acid chlorides, anhydrides and amides of acetic acid.

Halogen substitution products—chloroacetic and aminoacetic acid.

Esters—ethyl acetate, nitrate, sulphate.

Fats and oils—glycerol, soaps, lactic, oxalic, tartaric and citric acids.

Amines, urea.

Carbohydrates—glucose, fructose, cane sugar, starch, cellulose.

Benzene, toluene and other homologues.

Halogen, nitro, amino and sulphonic derivatives.

Phenol, benzaldehyde, benzoic acid.

The diazo-reaction and azo-dyes.

Naphthalene and its hydroxy, nitro, amino, and sulphonic derivatives.

Anthracene, anthraquinone and hydroxy-anthraquinone dyes.

A comprehensive study of dyes in general and colour and chemical constitution.

### Practical.

**A. QUALITATIVE ANALYSIS—**of simple substances including arsenates, phosphates, chromates and insolubles.

**B. VOLUMETRIC ANALYSIS.—**(standard solutions to be provided.)

1. Estimation of sod : hydroxide, sod : carbonate and ammonium hydroxide by titration with standard hydrochloric acid.
2. " ammonium salts.
3. " calcium (acidimetric.)
4. " iron (ferrous and ferric) with Pot permanganate.
5. " Calcium and lead, "
6. " Sodium nitrate.
7. " Iron (ferric) with Pot : dichromate.
8. " Iodine with sod : thiosulphate.
9. " Copper sulphate "
10. " Pot : Permanganate "
11. " Pot : Dichromate with sod : thiosulphate.
12. " Bleaching powder "
13. " Alkali sulphites and sulphides with iodine.
14. "  $As_2O_3$  and  $Sb_2O_3$  with iodine.
15. " Chloride with silver nitrate.
16. " Silver with standard thiocyanate.
17. " Hardness of water.

**C. GRAYIMETRIC.**

Estimation of sulphate and chloride.

**D. ORGANIC.**

1. Detection of elements in organic compounds.
2. Detection of radicals in organic compounds.
3. Four typical preparations of organic compounds.

## Textile Chemistry.

### BLEACHING.

The chemistry of oils, fats and waxes. Soap and its manufacture. Properties of soap solution. Detergent action of soap. Determination of the emulsifying power of soap solutions.

Sulphonated oils and manufacture of Turkey red oil. Analysis of soap and Turkey red oil, emulsions and emulsifications. Patent soaps like monophile soap, neckal B. X. Igrpon T.

The process of bleaching by chlorinated and non-chlorinated methods i. e., the chemistry and practice of desizing, alkali boiling, scouring, hypo washing etc. Formation of oxycellulose and hydro cellulose. Methods of estimating and identifying them as faults in bleaching. Stains and their removal.

The washing machine and the passage of cloth through them. Chemicking and scouring tanks. The use of winces and pot eyes. A detailed study of the working of all kinds of kiers. (The injector type, the puffer pipe, the centrifugal pump type, the external multi tabular heated type). The scrutching machine and the passage of cloth through it. The costing of bleaching.

Bleaching of coloured bordered fabrics, loose cotton for hospital accessories, bleaching of linen, and the bleaching and scouring of silk and wool with a special study of the method of stoving.

A historical account of bleaching from grassing to the different methods followed in the present day.

**MERCERISATION.** The history and the development of the process. The methods of mercerising yarn and piece goods. The machinery used for the purpose with the improvements up to the present day. Tests and properties of mercerised cotton. Immunisation of cotton. The plan for the lay out of a bleach house with the installation of the following machines; stitching machine, singeing machine, washing machines for the uses of desizing, washing, bleaching, scouring etc., kiers, pilling pits and cutching machine.

Preparation of Turkey red oil. Properties of Turkey red oil and determination of the percentage of fatty matter present in it. Estimation and nature of the fatty matter present in soap. Analysis of soap and Turkey red oil. Available chlorine in bleaching powder. Experiments demonstrating the different processes in the boiling and bleaching of cloths. Boiling in dilute caustic soda, washing and drying of cotton and jute. Treatment with bleaching liquor, permanganate, sodium peroxide. Tests for oxy and hydro cellulose. Copper number determination, scouring and bleaching of wool. Degumming and bleaching of silk. Method of mercerisation and properties of mercerised cotton. Quantitative estimation of fibres. Preparation of wheat starch from the flowers supplied and the estimation of gluten. Action of chemical reagents on starch and the preparation of soluble starch. Microscopical appearance of different starches used in textile industry and determination of their gelatinising temperature. Effect of various starches on cotton and the feel it imparts. Quantitative and qualitative estimation of the impurities in china clay. Testing of similar substances used in finishing. Preparation of materials like hydrosulphite, red liquor, and similar substances.

A review of the 1st Year portions with the additions of acid-chrome dyes mordant, dyes, mineral colours with special importance to mineral alkali. Natural colours like indigo, logwood, fustic, cutch, the old, new and simplified process of Turkey red dyeing. Alizarine red and alizarine dyestuff on different mordants. Insoluble colours produced on the fibre. Developed or ingrain colours. Para red. Naphthols and different methods of dyeing. The vat colours and other similar series. The general indications as regards dyeing properties and the different processes of dyeing on different fibres. Aniline black and other colours produced by

**oxidation.** Stripping agents, garment dyeing and dyeing of acetate silk, etc., the dyeing of cotton in different forms, loose cotton, cotton hanks, beam cheese and piece goods. Machinery used in dyeing, vats, jiggers, padding machine, ageing and developing machine, water mangle, Hydro extractor and drying range.

**PRINTING.** The history and development of printing, styles of printing direct, dyed discharge, resist, tie up, battick. The methods of printing-block, spray, stencilling aerograph, screen and roller and metal printing. Thickening agents, mordants, and assistants; colour mixing, preparation of the cloth for various kinds of printing.

The different methods of dyeing with acid colours. Experimental dye trials with fixed percentage of shade on different fibres. Acid and acid mordant colours of various manufactures on wool. The effect of using different mordants and assistants. The various processes of dyeing Turkey red. Application of indigo on cotton with different vats. The dyeing of other series of vat dyes such as indanthrene, algol, hydron. A detailed study of the solubilised vat colours such as indigosols etc., the preparation of stock vats. Importance of reduction. The special methods of blacks, blues etc. Application of vat dyes on silk and wool. The impregnation and development in the dyeing of naphthols. The starting bath and the feeding bath. The base and slat method. Dyeing of mineral colours, chrome yellow, chrome orange, chrome green, iron buff, khaki, prussian blue etc., Dyeing of natural colours like indigo, logwood catechu, and other natural dyes, from Travancore forests.

## COTTON SPINNING.

**SPINNING.** The principles involved in draw frames; analysed study of draw frames; different types of stop motions and their merits; coiler and can motion; types of rollers, diameters, speeds etc., to suit different cottons; common defects, remedies.

Use and objects of fly-frames such as roving frames; study of all the mechanisms and gearing arrangements in fly frames; theory of epicyclic train of wheels and differential motions; winding mechanisms and box of tricks.

Calculations referring to draft, speeds etc., common defects and remedies.

**PRACTICAL.** Demonstration of the working of the machines; practice in adjusting different mechanisms for different cottons and counts; testing of silver and rovings in order to determine the difference between the actual and calculated results; position of pulleys in relation to the main driving shafts.

Text book: Cotton spinning by W. S. Taggart II Vol.

## WEAVING.

(a) **MACHINES AND MECHANISMS.** Positive tappet-shedding (woodcraft, oscillating and scroll tappets), single and double lift dobbies (Keighley Dobby, Knowles positive open shed dobby, Black Burn dobby, Cross Border dobby). Pegging for R. H. and L. H. Dobbs; common defects and remedies; solid cylinder Dobby shedding.

(b) **DESIGN.** Study of construction of standard weaves such as honey-comb; huck-a-back, crepes, mocklenoes, diamond Bedford cords, and piques; analysis of sample fabrics and transferring the design on to the points paper; suitability of particular weaves to fabrics. General survey of fabrics made in India.

(c) **CALCULATION.** Resultant and average counts; equivalent counts in different denominations; relative weights and cost of twist yarns; weight and cost of warp and weft yarn in commercial form; winding, warping, and beaming calculations.

(d) **PRACTICAL.** Practice in warping, beaming, etc., exercises in tappet changing and tying the healds; pegging for dobby. Power-loom and dobby weaving practice. Tying and treadling practice for different weaves in hand looms.

## THIRD YEAR

## TEXTILE CHEMISTRY AND FINISHING.

A detailed study of the various materials used in the 'finishing' of textiles. The occurrence and properties of filling agents like gypsum, calcium carbonate, epsom, silicates, and sulphates of barium. The preparation and properties of starches in general and the manufacture of soluble starches and their advantage in the industry. The feel and effects produced by the various starches such as potato, tapioca, sago, wheat, rice, maize, etc.. A very detailed account of the physical and chemical properties of starches such as microscopical appearance, thermal depolymerisation, action of alkalies, acids, and various other reagents. The properties of antiseptic bodies like phenol, salicylic acid, boric acid, copper salts, formalin etc., and their influence on cotton and starch. Similarly, the substances used as deliquescent like the chlorides of magnesium and zinc and glycerine. Softeners like oils and Turkey red oil. Tinting materials like ultramarine blue and smalt and aniline dyes. Fire proofing agents like tungstates, phosphates, silicates and borates, water proofing agents like rubber latex, paraffin wax, zinc soaps, etc.

A detailed study of the working and adjustments of the various machinery used in finishing, including the object of each and the feel and look it imparts to the cloth eg., the water mangle, the starching mangles including the simple stiffening mangle. The back filling mangle and the friction starch mangle. The vertical and horizontal drying range and expanders and the principle underlying them. The belt stretching machine and the stentering machine with the woff straightening motion. The damping machine and the different kinds of calendering machines. The feel and look imparted by calendering to goods after calendering. The theory of the lustre given by goods after schreiner and the study of the machine. The folding machine and the baling press.

\*The regular practice of finishing and the general recipe for a pure finish, assisted or light finish, medium and heavy finish, with special reference to the commonly occurring goods such as mulls, long cloths, twills and suitings.

The chemistry and detailed manufacture of viscose silk, cuprammonium silk, acetate silk, and chardonnet silk. Methods of identifying them. A comparison and contrast of the physical and chemical properties of art silk and pure silk. A general survey of other synthetic fibres like lanitol and nylon.

Analysis (both qualitative and quantitative) of a mixture of fibres or of fibres in a fabric containing silk, wool, rayon, cotton and other fibres.

A detailed account of the molecular structure of fibres. This portion is an advanced study of the fibres in general as the student has now a sound basis of inorganic or organic chemistry. Percentage of dressing determination in a fabric, and analysis of cloth.

The preparation of standard sodium hydroxide and hydrochloric acid by preparing a standard solution of oxalic acid. Percentage of purity of stores materials like, sulphuric acid, hydrochloric acid, nitric acid, acetic acid, oxalic acid, soda ash, sodium hydroxide, borax, copper sulphate, potassium dichromate, sodium sulphide, Glauber's salt, chrome alum, ferrous sulphate, hypo, ammonia, tartar emetic aniline salt, aluminium sulphate.

Analysis of patent products like soaps and emulsifying agents. Estimation of dressing in a given fabric. Quantitative analysis of fabric containing different fibres.

## Dyeing Theory.

Historical development of machine dyeing. Materials used in the construction of dyeing equipments. Machinery for artificial silk, silk and wool dyeing, dyeing

\*Method of water proofing and fire proofing of fabrics also.

of hosiery and union goods. The theory of dyeing. The theory of colour and colour matching. The importance of wetting out agents. Stripping agents. Use of patent materials of different manufacturers. Selection of colours according to requirements. The testing of dyestuffs and dyed samples. Determination of simple and mixed dyestuffs. Estimation or evaluation of dyestuffs., Damage and defects in dyed goods. Comparison and tests of different kinds of blacks, blues and reds and greens. Lay out and plan of a dye house with full equipments and cost of dyeing.

**TEXTILE PRINTING.** Continuation from the second year.

Mordants and their uses and effect. Thickening agents and various assistants. Method of printing, basic, mordant, direct, acid, pigment, vat, indigosol, sulphur oxidation colours, nitroso blue, insoluble azo colours, naphthols, rapid fast, rapidogen etc., single and multi colour effects, special effects. The common faults in printing. Treatment of goods after printing. Ageing, dunging, drying, steaming, fixing, raising, developing, cutting, washing, drying etc.

**PRACTICAL.**

Preparation and use of different oils, fats, and metallic mordants like, aluminium, copper, tin, iron etc. The application of oxidation colours like aniline black by different processes i. e., dyed black, aged black, steam black. Naphthols, para red and other insoluble azo-colours. The extraction and application of natural colouring matters and their application on different fibres. Tests for fastness of dyed fabrics. Removal of stains. Dyeing of hosiery and union goods and garments Dyeing and redyeing. Identification of chief types of colouring matters on dyed goods. Experimental dye trials to determine the evaluation of dyestuffs. Detection of mixed colours. Practice in matching different shades on cotton, wool, silk, and artificial silk. A detailed study of mixing of colours with special reference to their physical appearance.

**PRINTING.**

Engraving of simple designs on wood and metal. Hand block printing with loose colours on pieces to give training in hand-printing technique. Stencil cutting and stencilling on pieces. Preparation of special mordants and thickeners and experiments demonstrating the printing and after treatments in the application of mordant basic, direct, sulphur, vat, and naphthol colours by the steam style, alizarine by the dyed style, discharge and resist style on direct basic naphthols and indigo dyeing and aniline black by steam and discharge style.

Besides the experimental dyeing and printing the students get ample chance and facility for working in the commercial section of the Institute where there is plenty of work in bleaching, dyeing and printing.

**Text Books:—**(i) Manual of Textile Printing by Knecht and Rawson.

(ii) The Chemistry and Practice of Bleaching and Finishing by Percy Bean Vol. I and II.

(iii) Manufacture of Artificial Silk by Wheeler.

(iv) Manual of Dyeing by Knecht Vol. I and II.

### **Industrial Economics.**

Labour organisation: Industrial legislation. Organisation of capital. International relations of labour and capital. Problems connected with the relations of capital, labour and the State. The launching of an industrial enterprise. Factory planning and organisation. Departmental functions. Purchase and control of raw materials. Wage systems. Welfare work. Location of industries. Principle of managements; scientific management, Departmental relations. Mass production. Standardisation and equipment. Practice instructions. Records. Book-keeping and office organisation. Contracts. Advertising and accounting. Outline of engineering organisation, Planning, processing. Standard times of machine

and hand operation. Labour remuneration. Graphical and statistical control. Inspection, Selection and training of employees. Establishment charges. Allocation according to percentage, hourly rate, departmental and machine rate methods Depreciation of buildings and plant. Maintenance. Reserve. Insurance and compensation. Railway and shipping rates. Financial organisation. Partnerships. Conditions of contract. Specifications. Inland and foreign bills. Banking operations.

TEXT BOOK. Engineering Economics by Burnham.

### Descriptive Engineering.

Steam and its properties. Generation of steam, boilers, economisers, superheaters. The reciprocating steam engine Condensers. Water turbines. Steam turbines, Gas engines. Producer gas engines. Oil engines. Pressure indicators and indicator diagrams. Tests for I. H. P. and B. H. P. and mechanical efficiency, Power transmission and power cost.

TEXT BOOK: Heat Engines by Wilkins.

### Chemical Engineering.

Materials used in chemical plant construction. Principles of heat transmission and of the flow of liquids. Measurement and control of temperature. Methods of heating and cooling. Storage and transportation of solids, sludges, liquids and gases. Unit types of plants employed. Agitation, distillation, evaporation, concentration, pumping, filtration, drying, pulverising, mixing, etc.

TEXT BOOK. An Introduction to Chemical Engineering by A. F. Allen.

#### DYE CHEMISTRY.

TEXT BOOK. Synthetic dyestuffs—By Cain and Thorpe.

#### THEORY.

HISTORICAL INTRODUCTION; Tar distillation: Coal tar primaries Intermediates. The general chemical operations of colour works, such as nitration, sulphonation, chlorination, oxidation, reduction, alkylation, diazotisation and alkali fusion. A study of typical intermediates obtained by the above process. The manufacture, properties and chemical constitution of typical colouring matters of the following groups:—Nitro, nitroso, azo, stilbene, pyrazoline, diphenyl methane, triphenyl methane, xanthene, acridine, quinoline, thiazole, indamines, indophenols, azine, azonin, oxaline thiazine, sulphide hydroxylactone, hydroxyquinone, anthraquinone, and indigo. Recent developments in the use of coal tar colours.

(Pages 1 to 204.)

ANALYSIS OF DYE-STUFFS: Methods 334 to 384.

PRACTICAL. Pages 285 to 299.

#### A. PREPARATION OF THE FOLLOWING INTERMEDIATES.

- |  |                |
|--|----------------|
| 1. P-nitroacetanilide and P-nitraniline . . . . .        | Nitration.     |
| 2. Benzidine from nitrobenzene . . . . .                 | Reduction.     |
| 3. Naphthionic acid or Anthraquinone Sulphonic . . . . . | Sulphonation   |
| 4. Anthraquinone . . . . .                               | Oxidation      |
| 5. B-naphthol . . . . .                                  | Alkali fusion. |

#### PREPARATION OF THE FOLLOWING DYES.

- |   |                                 |
|---|---------------------------------|
| 1. Orange 11, Fast red B. or Fast red A.              |                                 |
| 2. Aniline, blue, Alkali blue, soluble blue . . . . . | Azodye<br>Triphenyl<br>methane. |
| 3. Fluorescein . . . . .                              | Do,                             |
| 4. Methylene blue.                                    |                                 |
| 5. Safranin.  |                                 |
| 6. Primuline,   |                                 |
| 7. Indigo,  |                                 |

### C. Analysis : TITRATION WITH TITANOUS CHLORIDE.

(A) SPINNING. Theory of spinning; detailed study of ring-frames; theory of twist and building motions, spindles and different types; high draft-system of spinning and its merits: complete study of mule-spinning, theory of doubling and doubling frames, wet and dry; different systems of general study of combers, objects of combing, Hailman and Nasmith combers; silver and Ribbon Lap machine; speeds, gauges, drafts etc., for different counts; reeling and common defects in reeling dept; common defects and remedies in spinning section; general study of waste spinning;

(B) CALCULATION. Gearing, speeds, production, draft, twist and constants; count, production and efficiency of the machines etc.

(C) PRACTICAL. Gauging and setting the rings, rollers; practical dotting and adjusting the buildings and drafting mechanisms; use of different testing machines, practical demonstration of the working of the machines.

TEXT BOOKS : Cotton spinning by Taggart Vol. III.

                  "          "          by Thomas Thornley

### Weaving.

(A) MACHINES AND MECHANISMS. Jacquards; Harness and Harness building; piano-card cutting machines; general principles and working of tappet machine and automatic weft supplying loom; general lectures on mill management and planning; common defects, causes and remedies; defects in fabrics; study of box motions and principles involved; Diggles; Wright-Straws, Cow Burns Pecks, drop box motions and circular box motions.

(B) DESIGNING. Terry and plush fabrics; extra warp and weft figuring; double cloths; plain and fancy repps; jacquard designing; principles of Leno and gauze weaves; Draw Boy harnesses for elaborate designs.

(C) CALCULATION. Costing of fabrics; quantitative calculations for warp and weft; conditioning production and efficiency of looms. Calculations involved in the analysis and reproduction of woven fabrics.

(D) SIZING. Theory and mechanisms of sizing, hank-sizing ball warp sizing and slasher sizer, Yorkshire dressing, hot air sizing machine etc., sizing mixing for coloured and fancy goods; common defects and remedies in sizing dept.

TEXT BOOKS : i. Cotton Mill Management by B. S. Benjani.

                  ii. Advanced, Textile Design by Watson, I and II Vol.

                  iii. Calculations in yarns and fabrics by Bradbury.

                  iv. Textile Design and colour, by Watson.

                  v. Preliminary operations of weaving by Nisbet.

                  vi. Textile Design: Pure and applied by woodhouse and Milne.

### CERTIFICATE COURSE IN TEXTILE TECHNOLOGY AND TEXTILE CHEMISTRY.

#### FIRST YEAR.

#### MATHEMATICS.

Areas of regular and irregular plane figures, surfaces and volumes of regular solids (sphere, cylinder, cone, pyramid etc.)

Ratio, proportion, variation averages; percentage mixtures, proportions & costs.

Trigonometrical ratios; Graphical determination of their values: determination of all trigonometrical ratios of an angle from any one known ratio; simple application to the solution of right-angled triangles; problems in heights and distances (simple cases only).

Contracted multiplication and division.

#### PHYSICS.

Same as for Diploma Students, the portion marked therein in asterisks being omitted and the rest dealt with in a more elementary manner.

Free hand and Model Drawing.

Same as for Diploma Students.

Machine Drawing.

Same as for Diploma students.

Workshops Practice.

Same as for Diploma Students.



## CHEMISTRY.

**INORGANIC :** Laws of chemical combination. Equivalent and atomic weights : valency : molecular weights of gases and vapours : Symbols—Equations.

Periodic classification of the elements—the modern periodic table.

Study of the following common metals and non-metals and their compounds according to groups with special emphasis on compounds used in textiles.

**NON-METALS :** Hydrogen, oxygen, halogens, sulphur, nitrogen, phosphorus, arsenic, carbon, silicon, and boron.

**METALS :** Sodium, potassium, ammonium, magnesium, calcium, barium, aluminium, copper, silver, zinc, mercury, tin, lead, antimony, bismuth, chromium, Manganese, iron, cobalt and nickel.

(Chief ores : principle of preparation of metal without detailed properties of the metal ; the important compounds used in textiles).

Electrolytic methods of preparation of metals, alkalies, and salts.

**PRACTICAL.**

1. Manipulation of glass tubes and corks. Fitting up of apparatus.

Study of the common Burners.

2. The use of measuring vessels and the balance.

3. Purification of water by distillation—Fractional and vacuum distillation.

4. Solution—the common solvents—determination of the solubility of a solid—solubility curve.

5. Density of air and carbon-di-oxide.

6. The hydrogen equivalent of the metals.

7. The oxygen equivalent of the metals.

8. Preparation and properties of oxygen and hydrogen.

9. Preparation and properties of hydrogen chloride and chlorine. Preparation of Pot. Chlorate.

10. Preparation and properties of sulphur-dioxide and hydrogen sulphide.

11. Equivalent weights of acids and bases.

12. " " Oxidising and reducing agents.

13. Simple volumetric estimations with standard solutions of acids, alkalies, and pot. permanganate.

14. Preparation and properties of nitric acid and oxides of nitrogen.

15. Preparation of typical salts, ferrous sulphate, copper sulphate, aluminium chloride and stannic chloride.

16. Simple qualitative analysis (excluding phosphates, arsenates, chromates and insolubles) by the wet and dry methods, of substances containing not more than one acidic and one basic radical.

Textile Chemistry.

Same as for Diploma students.

Cotton Spinning.

Same as for Diploma students.

Weaving.

Same as for Diploma students.

**SECOND YEAR.****MATHEMATICS.**

Volumes of irregular solids ;

Theory of indices, logarithms to base 10 ; use of the logarithmic tables etc.

Manipulation and evaluation of complicated Engineering formulae.

Graphs of statistical data ; determination of laws from graphs ; construction of alignment charts.

Trigonometrical functions of compound angles and addition Theorems ;

Simple cases of solution of triangles.

Calculations in yarns and fabrics

Electro-technics.

Same as for diploma students.

**PHYSICS.**

The portions marked in asterisks in the Syllabus for the Diploma. Second year to be omitted and the rest dealt with in a more elementary manner.

Machine Drawing.

Same as for Diploma students

## CHEMISTRY.

## Physical Chemistry.

Gas laws ; solution ; osmotic pressure ; determination of molecular weights of dissolved substances by Boiling and Freezing points methods.

Reversible reactions—examples ; influence of mass ; Le Chatelier's Theorem.

Colloids ; absorption.

## Organic Chemistry.

Methods of purification and tests for purity, Detection of elements ; ultimate analysis ; formulae, isomerism.

Methane, ethane, Ethylene, acetylene.

Ethyl iodide ; chloroform and iodoform.

Aldehydes and ketones—formaldehyde, acetaldehyde, acetones.

Fatty acids—formic and acetic.

Esters—Ethyl acetate.

Fats and Oils—Glycerol, soaps.

General treatment of carbohydrates.

Benzene and toluene.

General treatment of—halogen, nitro, amino, and sulphonic derivatives.

Phenols. benzaldehyde, benzoic acid.

The diazo-reaction and azo-dyes.

Classification of dyes.

## PRACTICAL.

A. Qualitative Analysis of simple substances including tests for arsenate, phosphates, chromates and insolubles.

B. Volumetric Analysis. (standard solution to be provided.)

1. Estimation of sodium hydroxide, sod : carbonate and ammonium hydroxide by titration with standard HCl.

2. Estimation of Iodine with standard  $\text{Na}_2\text{S}_2\text{O}_3$ .

3. „ Copper sulphate „

4. „ Bleaching powder „

5. „ Chloride with silver nitrate.

C. Organic.

1. Detection of elements in organic compounds.

2. Three typical preparations of organic compounds.

## Textile Chemistry.

Same as for Diploma students.

Cotton Spinning.

Same as for Diploma students.

Cotton Weaving.

Same as for Diploma students.

## EMBROIDERY AND KNITTING COURSE.

## FIRST YEAR.

## Drawing and Colour.

Drawing in line from natural forms and ornaments. Application of colour to designs for fabrics. Complementary colours. Harmonies and contrasts. Effect of juxtaposition.

## Mathematics and Mechanics.

Revision of addition, subtraction, multiplication and division of algebraic quantities. Simple equations, simultaneous and quadratic equations. Simple graphs, exercises in plotting graphs with reference to production, costs, correction of errors of observation and fluctuations in prices of raw materials.

The following be illustrated from mechanisms used in knitting machinery ; Force, work, power, mass, energy. Elementary calculations—work and horse power Communication by motion ; pulleys, belts : calculations of speeds of pulleys, clutch drives, spur wheels, bevel wheels ; helical wheels, worm gearing. Mechanical advantage and velocity ratio. General mechanisms ; simple and compound levers, cranks, eccentrics and cams, screw threads, ratchet wheels and paw's. Rotary, oscillating and reciprocating motions.

## Hosiery Raw Materials and Spinning

The raw materials used in hosiery with practical work in judging and valuing these materials. Outline of the operations in the manufacture of the chief classes of yarns used in the hosiery trade. Practical work on the apparatus for testing yarns for counts, strength and stretch.

### Hosiery Design.

The representation of all classes of lace, tuck, vertical stripping and pearl stitch designs on squared paper and study of the methods by which these can be made on the machine. Principles of form and points to be observed in designing of tuck, lace and embroidered fabrics.

### Hosiery Fabric Analysis.

The analysis of all classes of knitted fabrics and garments for their accurate production in factory. Estimation of the machine gauge, yarn size, nature of stitch ascertaining designs of fancy fabrics and methods of production on the frame.

### Hosiery Manufacture.

Various systems of hosiery manufacture, full-fashioned, cut-up and seamless branches. Methods of making and putting together all classes.

TEXT BOOK. Hosiery Manufacture by William Davis M. A.,

### Bleaching, Dyeing, Printing and Finishing.

Chemical and physical properties of fibres. Their recognition by microscopical and chemical methods. Water for industrial purposes, removal of natural impurities in water and systems of water softening. Carbonising and bleaching processes. Bleaching of hosiery.

Materials used in dyeing; assistants, developing agents, their properties and methods of application.

Classification of dyestuffs. Application of acid dyes on wool and silk, basic dyes and direct dyes on cotton wool and artificial silk.

Diazotising and developing.

### Embroidery.

A brief history of needlework. The use of the following apparatus-implements in needlecraft: needles, scissors, tape and yard measure tracing wheel, thimble, bodkin, stiletto, frame and shuttle. Study of the various stitches: plain, tacking, hemming, backstitching, seaming, felling, marking by cross stitches, darning and ornamental. Method of work and uses of these stitches in whipping, button holing, hemstitching, herring, boning feather stitching, chain stitching, over casting blanket stitching, smocking, honeycombing, fagotting, couching, steam stitching, satin stitching, snail trail or cable stitching, twisted chain stitching, long and shot stitching, French knot stitching and tucking. Gathering, stocking and setting in of gathers, fixing of tapes, fixing of buttons of different kinds, pleating, setting of pleats, fixing of gussets, fixing of strengthening tapes, button holes on straight materials, button holes on cross materials, fixing of hooks and eyes, making loops and eyelets for hooks, flannel seams and borders, fixing lace, inserting insertions, binding, pinking, fixing of cross way bands for false hems, fixing of cross way bands for strengthening necks etc., finishing of openings e. g., shirt fronts, counter hem, piping, scalloping, fixing of breasting slip stitching, ap lique work and marking by methods other than cross stitching.

MENDING. Patching in calico, print, flannel and other woollen materials. Invisible patching of fine materials like silk, muslin, etc., Darning; straight darn, hedge-tear darn, knife-cut darn, darning over a thin place, stocking peb darning, Swiss darn grafting and taking up a "ladder". Repairing frayed edges, hems, seams, bands etc.,

TEXT BOOK. A Text Book of Needle work, knitting and cutting out by Elizabeth Rosemmer.

## SECOND YEAR.

**Hosiery Manufacture**

A more advanced study of the portions mentioned in the first year course.

**Hosiery Fabric Analysis .**

A more advanced study of the portions finished in the first year.

**Textile Calculations**

Yarn numbering system, counts of folded yarns, plating calculations, average counts in a fabric, weight percentages of mixture articles. Costing of raw materials and yarns. Setting of knitted fabrics, calculations relating to shafting, speeds of frames and production on the various types. Calculations for the warp loom trade. Costing of all classes of hosiery and underwear.

**Hosiery Machine Mechanism**

A detailed study of all the machinery used in the department including the methods of yarn feed and winding up tackle, adaptability of the machine for the various purposes. Drawing of the chief functional parts.

**Dyeing, Printing and Finishing.**

The mordanting of wool. The application of acid mordant colours on wool, sulphur colours on cotton, vat colours on cotton and silk. Aniline black on cotton. Colour matching. Correction of dyeing faults. Identification of the dyestuff on the fibre.

Chemicals used for the textile printing. Preparing the fabric for Easy methods of printing by hand blocks.

Testing of soaps and dyeing assistants. Evaluation of dyestuff. Chemical properties and dyeing affinities of dyestuff.

Practical work in scouring, bleaching, dyeing, printing and finishing.

**Knitting**

Knitting on two needles or pins, casting on and off, how to pick up stitches, plain and pearl knitting, other patterns, increasing and decreasing. Knitting on four needles, casting on and off, circular knitting in plain, ribbed or fancy patterns.

Crochet; chain, double, treble, long treble and patterns in edging and insertion.

Ribbon and gold thread work.

Cutting out; a square, triangle, rectangle bias, pieces; use of warp and weft of materials to secure strength; use of chart paper, inch measure, paint, tacking threads, tracing wheels, paper patterns; how to take measurements from a garment and to make the necessary paper pattern, how to arrange the design of printed materials when duplicating.

Making of household articles and garments; plain pillow cases, frilled pillow cases, cushion cover, curtains, umbrella cover, mosquito curtain, tray cloth.

Making of garments such as frocks, shirts drawers, petticoats, jumber, blouses and syrian girls' jackets.

Bead work; hand bag. Doyle, cushion cover, etc.,

**B. Sc. (ENGINEERING) DEGREE EXAMINATIONS.**

## FIRST YEAR

**FIRST EXAMINATION IN ENGINEERING, PART I.****Mathematics.**

**ALGEBRA.** Elementary tests of convergence and divergence of series (comparison with the standard series); series with alternatively positive and negative terms etc., application of the binomial theorem for any index; Exponential theorem Logarithmic series. Evaluation of logarithms to base  $e$  and to base 10; Partial fractions; graphical solution of equations,

**TRIGONOMETRY.** Complex quantities. De Moivre's theorem and some simple applications: Expansion of  $\sin x$ ,  $\cos x$ , and  $\tan x$  in powers of  $x$ , inverse notation, expansion of  $\sin nx$ , and  $\cos nx$  in powers of  $\sin x$  and  $\cos x$  and of  $\sin x$ ,  $\cos x$  in terms of sines and cosines of multiples of  $x$ .

**CALCULUS.** Elementary study of the properties of infinitesimals and limits: some common limits;  $\frac{\sin x}{x}$ ,  $\frac{\tan x}{x}$  etc. when  $x$  tends to zero;  $\frac{x-a}{x-a}$  when  $x$  tends to  $a$ , differential coefficient as a rate measurer and as the slope of the tangent to the curve representing the function; Differentiation of simple algebraic, trigonometric and transcendental functions; applications of the derivative to finding tangent, normal, subtangent, subnormal etc., and to the rates of variation of related quantities; successive differentiation; mean value theorems; Taylor's and Maclaurin's theorems and series; their use in expanding simple functions; maxima and minima simple problems on maxima and minima; evaluation of indeterminate forms. Graphical differentiation.

**CO-ORDINATE GEOMETRY.** Equations of curves; Locus of points moving under given geometrical conditions; the straight line, pairs of straight lines, the circle, and the standard equations of the parabola, ellipse and hyperbola. (Cartesian co-ordinates only).

**MENSURATION.** Plane areas, regular and irregular; areas of the surfaces of regular solids; volumes of regular and irregular solids.

#### MECHANICS.

**STATICS.** Forces in a plane, concurrent, non-concurrent and parallel resultant force; triangle and polygon of forces; moment of a force about a point; principle of moments; levers; couples; reduction of a system of coplanar forces; conditions of equilibrium of the same; Friction; angle of friction; sliding friction; laws of limiting friction; action of brakes; Centre of gravity of regular areas and solids (without the use of integration); Simple machines like screw, inclined plane, wheel and axle etc.,

Principle of virtual work; applications; Behaviour of materials subjected to stress; Modulus of elasticity; of rigidity and bulk modulus; Resilience; Shear Force and Bending moments for cantilever and simply supported noncontinuous beams under simple loading. Stresses in frames; Bow's notation, funicular polygon; Determination of stresses in simple roof trusses (King post, Warren girder, Pratt etc.,) The method of sections for determining stress in frames.

**HYDROSTATICS.** Fluid pressure. Pressure at a point. Pressure at different points in a homogeneous fluid; Resultant thrust on any surface; conditions of equilibrium of floating bodies, the diving bell; Common pump, air pump, Bramah press etc.

**DYNAMICS.** Velocities and accelerations, both linear and angular; composition and resolution of velocities and accelerations; relative velocity and acceleration. Newton's laws of motion; work, power and energy. Motion of bodies under gravity, projectiles; impact of bodies.

#### ENGINEERING CHEMISTRY.

(a) **ELEMENTS OF PHYSICAL CHEMISTRY.** The Kinetic theory; Gas laws. Deviations from gas laws. Critical phenomena and liquefaction. Vapour pressure and boiling point

Solutions. Elements of Phase rule. Alloys. Osmosis.

Mass action. Chemical equilibrium.

Catalysis. Theory of Electrolytic dissociation (treated in an elementary way) E. M. F. of cells. Electroplating and electro-refining of metals. Electrolytic preparation of alkalis and salts.

Corrosion of metals and its prevention.

Colloids. Coagulation by electrolytes.

Colloidal properties of clay.

Absorption.

(b) **ELEMENTS OF ORGANIC CHEMISTRY.** Petroleum, occurrence and fractionation. Distillation of coal and wood; methane, ethane, acetylene and benzene; methyl, alcohol, ethyl alcohol, phenol, formaldehyde, acetaldehyde, formic acid, acetic acid, ethylacetate, common animal and vegetable oils and soaps.

(c) **CHEMISTRY OF ENGINEERING MATERIALS.** Metals—Study of the following metals and their important alloys from the Engineer's point of view (manufacture, properties and uses) magnesium, zinc, aluminium, copper, mercury, lead, tin, chromium, manganese, iron, and nickel.

Iron, cast-iron, mild steel, alloy steels, wrought-iron, silicon steels etc.

**REFRACTORY MATERIALS.** Acid, basic and neutral and their use in furnace practice.

**MORTARS AND CEMENTS.** composition, properties and uses.

Theory of setting and hardening of mortar. Plaster of paris and portland cement. Corrosion of concrete and re-inforced concrete and its prevention.

**(GRINDING MATERIALS. (abrasives.)** Carborundum, emery and other abrasives in common use—general properties and uses.

**PAINTS AND VARNISHES.**

**LUBRICANTS.** Theory of lubrication, testing of lubricants.

(d) **TECHNOLOGY OF WATER.** Impurities of water and their removal. Temporary and permanent hardness—Production of scale. Corrosion and forming—softening. Treatment of water for town supply, boiler feed and industrial purposes

Boiler compounds. Elements of water analysis.

(e) **FUELS.** Solid, liquid and gaseous fuels, combustion, explosion, flame and smoke; surface combustion. Thermo-chemistry, calorific value of fuels.

#### LABORATORY COURSE.

**QUALITATIVE ANALYSIS.** of simple inorganic substances.

Qualitative analysis of alloys containing not more than three common metals

**VOLUMETRIC ANALYSIS.** Acidimetry, alkalimetry, determination of hardness of water. Estimation of calcium and iron using standard solutions of  $K_2MnO_4$  and  $K_2Cr_2O_7$ . Evaluation of bleaching powder using standard sodium thiosulphate. Estimation of chloride using standard silver nitrate.

**GRAVIMETRIC ANALYSIS** of sulphate radical.

Determination, of ash, moisture, and sulphur in coal. Determination of Calorific Value of solid and liquid fuels.

Analysis of fuel gases.

Determination of viscosity of lubricants.

#### APPLIED PHYSICS.

**HEAT.** High and low temperature measurement. Heat expansion of solids, liquids and gases and their practical consequences and applications. Absolute zero. Calorimetry, specific heat and effect of temperature, specific heats of gases. Change of state. Boiling point and effect of pressure upon it. Determination of height by hypsometer. Latent heat, connection between latent heat and temperature. Total heat of steam, super heated steam, methods of measuring dryness of steam, use of steam tables. Vapours and vapour pressure. Hygrometry.

Heat transmission, conduction and diffusion of heat, and determination of constants. Heat insulation and insulators in common use. Lagging of steam pipes. Convection currents. Ventilation of buildings. Radiation and absorption of heat, Laws of cooling. Mechanical equivalent of heat. Isothermal and adiabatic expansion and equations for a gas. Second law of thermo-dynamics. Carnot's cycle, Heat engines and their efficiency. Absolute temperature. Entropy.

**ELECTRICITY AND MAGNETISM.** Electrostatic induction, condensers, theory of electrostatic potential, specific inductive capacity, electrostatic units. Condensers in series and in parallel. Energy of a condenser. Electrometers. Phenomenon of discharge; atmospheric electricity.

Magnetic attraction and repulsion, distribution of magnetism. Terrestrial magnetism. Laws of magnetism, magnetic force, magnetic fields. Calculation of magnetic fields due to current in a short straight wire, infinitely long wire, circular wire, solenoid. C. G. S. and practical units of current. Force in a magnetic field on a current carrying conductor, applications. Mutual action for two parallel conductors and coaxial coils. Electromotive force, units. Resistance, units, effect of temperature and light. Laws of resistance. Conductors and insulators, materials used in Electrical Engineering and their properties. Insulation of cables. Ohm's Law. Resistances in series and in parallel, shunts, earth returns, line leakage, Kirchhoff's laws. Networks.

Galvanometers, Astatic, Tangent, Moving magnet, moving coil, ballistic.

Ammeters, voltmeters, measurement of current and voltage. Use of potentiometer.

Magnetization of iron. Magnetic flux, flux density, permeability, susceptibility. Cycle of magnetization. Hysteresis, hysteresis loss. Magnetic circuit, leakage.

Measurement of permeability. Flux-meter use, of bar and yoker traction methods, ballistic method.

Electromagnetic induction. Flux linkage, Faraday's laws. Calculation. Eddy currents, energy loss due to them.

Inductance. Electrical inertia of a circuit, Lenz's law, growth and decay of current. E. M. F. of self induction. Units of self induction. Energy in the magnetic field, calculation of  $L$  for a coil. Mutual inductance, coupling coefficient Kelvin's Ampere balance.

Measurement of resistance by meter bridge, Wheatstone's bridge, High resistance measurement by direct deflection.

Heating effect of current. Joule's law, electrical equivalent, units of power and energy. Electric lamp. Arc lamp, heaters. Thermo-electricity, applications.

Chemical effects of electric current. Theory of dissociation. Faraday's laws of electrolysis. Electro-plating, electrotyping. Secondary cells. Theory and operation.

## BUILDING MATERIALS AND CONSTRUCTION.

### A. MATERIALS.

INTRODUCTION TO THE STUDY OF MATERIALS. Stone—Varieties met with in Southern India—quarrying, blasting with powder, dynamite and liquid oxygen—Dressing—Average strength and weight—Characteristics such as weathering, durability, facility for working, seasoning, and decay. Implements. Artificial stones, their preparation and uses. Hollow cement blocks.

BRICKS AND TILES. Brick earth—Tempering, Hand moulding, ground, pallet and table moulding. Machine moulding. Drying. Burning in clamps and Kilns Hoffman's and other continuous kilns. Coloured bricks and tiles. Pressed bricks Wire cut bricks. Roofing, flooring and drain tiles. Fire bricks. Average strength and weight. Characteristics of good bricks and tiles.

LIME AND CEMENT. Sources and properties of lime. Burning in intermittent and running kilns. Slaking. Mortar mixing. Fat and hydraulic limes Portland Cement. Hydraulic mortar. Sand. Surki. Concrete and its laying in foundations. Tests for lime and cements. Strength of mortars and concrete Plaster and Plastering. Pointing, White and Colour washing.

TIMBER. Growth of trees. Felling trees. Varieties used for building purposes. Seasoning. Preservation.

METALS. Pig iron, cast iron, malleable iron—pipes and columns of cast iron—Cast iron hollow screw pipes—Cast iron shoes for R. C. piles—Child castings—strength of cast iron—Form of wrought iron—Galvanised and corrugated iron—Tests and strength of wrought iron—Difference between hard steel and mild steel and their respective uses—Tempering and annealing and their objects—strength of steel and testing of steel—Copper—Zinc—Lead—Tin—Alloys—Their properties and uses.

## B. CONSTRUCTION.

**FOUNDATION.** Preparation of soil—Drainage of building site—Excavation—Stability and properties of soil—Natural slope—Working plans for foundations on level ground and on slopes—Setting or laying out buildings on the ground for excavating foundations. Trenches with vertical and with sloping sides—Timbering for trenches—Masonry and concrete foundations—Pressure on soil under foundations—Safe bearing power of different soils—Unequal settlement—Foundations on rock, good and bad soils. Indications of various methods of dealing with foundations in bad soils.

**MASONRY AND BRICKWORK.** Tools and appliances used by Masons and brick layers—Mason's Square—Mason's Level, Plumb bob—Straight edge, Trowels, Coursed and uncoursed rubble—Block-in-course—Ashlar of various sorts—Bond in stone masonry—String courses—Copings—Brick laying. Different kinds of Bonds. Bond at angles of walls, at door and window openings and in circular pillars—Foundations and footings—Plinth—Damp proof course—Damp resisting materials—Hollow walls—Thickness of main and cross walls—wood bricks and plugs—Dowels and cramps—Stone dressing—corbelling—Flat, segmental, pointed and relieving brick arches—oblique arches—Buttresses and counterforts—Retaining and breast walls—Scaffolding—Various knots and lashings and the suitability of each to certain circumstances—Blocks and tackle—Heldfasts—Guys—Use and construction of derricks, shear legs and trestles for hoisting heavy materials into position—bedding racking back—Lintel—Jamb—Reveal—Sills—Drip course—Precautions against settlement—Pise walling.

**CARPENTRY AND JOINERY.** Longitudinal, transverse, and framing joints—Iron straps and bolts—Fastenings—Details of joints—Doors, windows and ventilators—Centerings for Arches—Roof and bridge frames—Frames of timber and iron combined—Trussed beams.

## SURVEYING.

**CHAIN SURVEYING.** Instruments. Ranging and chaining lines. Errors in chaining, customary limits of error. Reconnaissance and fixing stations, Field book—obstacles in chaining—Plotting, Calculation of Areas.

(Students to carry out and plot an actual survey.)

**COMPASS SURVEYING.** The Prismatic compass and its details. Bearings and angles. Magnetic variation. Methods of reckoning bearings—whole circle and quadrantal. Application of Compass surveying. Field book. Local attraction and its elimination. Plotting. Closing error and its adjustment.

(Students to carry out an actual survey.)

**PLANE TABLE SURVEYING.** Instruments and their use. Setting the Plane Table. Fixing of position. Resection. Two and three points problems. Surveying with and without chain.

N. B. Practical tests or tests in field work will be conducted by the College at the end of each year.

## PRACTICAL GEOMETRY.

Position in space defined and exhibited. Fundamental rules of projection. The straight line and perpendicular plane. The oblique plane. Planes and Solid Figures in given position. The projection of curves and curved surfaces. Tangent planes to surfaces. Intersection of surfaces and Interpenetration of Solids. Development of surfaces of cylinders and cones. Helices and springs. Isometric projection.

## ENGINEERING DRAWING.

- A. **MACHINE DRAWING.** Copying accurately to scale drawings of:—Simple details of machines and structures such as rivets, rivetted joints, bolts and nuts, keys and cotters. Pipes and joints in pipes.
- B. **BUILDING DRAWING.** Masonry details such as Bond in Brickwork, foundations, footings etc. Arches, doors and windows. Timber joints, halving, lapping, notching. Details of a King post truss.



## SECOND YEAR.

## FIRST EXAMINATION IN ENGINEERING, PART II.

## MATHEMATICS.

**CALCULUS.** Curvature of a curve ; Radius of curvature ; Centre of curvature evolute and involute ; envelopes. Partial differentiation ; total differentials ; small errors.

Integration as the inverse of differentiation, standard forms ;

Integration by parts ; Reduction formula for  $\int \sin mx \cos^n x \, dx$ .

Integration as a process of summation and its application for determining areas, volumes, centre of gravity, centre of pressure, moments of inertia, work done by variable forces etc.

**CO-ORDINATE GEOMETRY.** The more important properties of the parabola, ellipse, and hyperbola.

Polar equations of conic sections, their tangents and normals at given points.

**STATICS.** Centre of gravity by integration ; stability of equilibrium ; equilibrium of strings on rough or smooth curves ; The catenary. A very elementary study of forces in three dimensions, (the wrench).

**DYNAMICS.** Motion in a circle. Uniform Circular motion, Centrifugal force ; Super-elevation ; balancing of engines ; conical pendulum ; motion in a vertical circle ; simple harmonic motion ; the simple pendulum. Moments of inertia (easy examples) about various axes ; radius of gyration ; motion of a rigid body about symmetric axis ; the compound pendulum.

Principle of conservation of angular and linear momentum. Principle of the conservation of energy (two dimensions).

## STRENGTH OF MATERIALS.

**TESTING OF MATERIALS.** Method of testing and appliances used in determining the elastic constants and in testing materials to destruction under tension, compression, shearing, torsion, and bending. Load extension diagrams. Form of Test pieces. Methods of gripping. Shearing tests. Calibration of testing machine. Torsion testing machine. Extensometers, Autographic recorders. Beam Deflections. Torsional strains. Tension and torsion of wires. Bending of light beams. Impact and hardness tests. Results of tests. Methods of testing under repeating and alternating stresses. Fatigue.

**MECHANICAL PROPERTIES OF METALS.** Elastic limit and yield point. Ductile strains. Ultimate and elastic strength. Factor of safety. Measures of ductility. Actual and nominal stress. Effect of shape of test pieces. Detailed properties of important metals. Raising the elastic limit by strain. Hysteresis. Hardening and Annealing. Influence of rate of loading. Compression. Fractures. Effects of temperature. Stress due to temperature changes.

**RESILIENCE AND FLUCTUATING STRESS.** Work done in tensile strain Resilience. Live loads. Resistance to shock. Fatigue. Limiting ranges of stress. Factors affecting endurance. Explanations of failure under fluctuating stress. Factors of safety.

**ELASTIC STRESS AND STRAIN.** Principle planes and stresses-Ellipse of stress. Circular diagram of stress. Principal strains.

**THEORY OF BENDING.** Relation between Bending Moment and shearing Force. Theory of Bending. \*

**STRESS IN BEAMS.** Moment of inertia of Sections. Graphical Methods. Standard steel Sections. Beams of uniform strength. Distribution of shear stress. Bending beyond elastic limit. Modulus of Rupture.

**DEFLECTION OF BEAMS, Uniform Curvature.** Relations between curvature, slope, and deflection (various simple cases.)

**TWISTING.** Stress and strain in pure Torsion. Power transmitted by shaft. Hollow shafts.

**FRAMED STRUCTURES.** Roofs and Roof Trusses. Braced cantilevers, Beams and Girders. Determination of stresses due to Dead load and to wind pressure, graphically and otherwise. Strength of Riveted Joints. Thin cylinders. Stresses and strains in thin shells subject to internal pressure.

#### HEAT ENGINES.

Effects of heat on solids, liquids, and gases. Change of state, critical pressures, volumes and temperatures.

Isothermal and adiabatic expansions and compressions. Derivations of formulae.

Specific heats. Universal gas constant.

Units of heat and units of work.

Laws of Thermodynamics. Carnot's reversible cycle, constant pressure and volume cycles.

Hot air engines, Ericson's Sterling's and Joule's cycles of operation.

Heat rejected or received during expansion, its rate, assuming constant specific heats.

Efficiency of a cycle, conditions for maximum thermal efficiency. Physical properties of steam, sensible and latent heat, absolute pressure.

Saturated, dry, wet, and superheated steam. Internal energy.

Fuels—Solid, liquid, and gaseous. Their properties and uses. Flue gas analysis.

Calorific values—Calorimeters :—Bomb and Junkers's.

General knowledge of fire tube and water tube boilers and their important mountings. Equivalent Evaporation. Factor of evaporation. Efficiency of a boiler.

Steam engines. Names and functions of the important parts of a simple condensing steam engine with one eccentric and an ordinary D slide valve. Admission, cut off, release and compression. Mean effective pressure assuming steam as a perfect gas.

Definition of lap and lead.

Indicator diagram of a condensing steam engine.

#### THEORY OF MACHINES.

Plane motion of a particle under variable acceleration—acceleration time graph. Force and Torque. Centre of gravity. Moment of force and couple. Moment of Inertia. Angular momentum. Instantaneous centre and velocity of various parts of a link motion. Klein's construction for acceleration. Simple Harmonic motion. Gyroscopic torque. Torsional oscillations.

Kinematic-pairs. Lower pairing. Higher pairing. Inversion, Relative linear velocity and acceleration. Bar chain, beam engine, drag link, Watts parallel motions Slidercrank chain, Toggle joint, Rocking piston, Pin and slot, Whitworth quick return motion. Double slider crank chain. Oldham coupling. Elliptic trammels, Elliptic Chuck, straight line motions—Grasshoppers motion. Peaneller's motion. Scott Russell's motion.

Copying mechanisms. Pantograph; combination of Watts parallel motion and Pantograph, modification of pantograph for Indicator rig. Application to Indicator pencil mechanism. Modification of Watts motion. Thomson's Indicator.

## Compound Pendulum. Centre of percussion.

### SURVEYING.

**PLANE TABLE SURVEYING.** Plane table surveying in combination with other methods.

**THE TELESCOPE.** Principles ; Refraction and Curvature.

**LEVELLING.** General Principles ; Forms of field book ; 'Types of levels ; uses and adjustments ; flylevels ; Reciprocal levellings, spot levels ; longitudinal and cross section levelling ; Contouring on land and water ; hand levels.

**EARTH WORK AND CAPACITY OF RESERVOIRS.** By contour lines and Cross section levellings.

**THEODOLITE.** Universal instrument. Use and adjustment of different types ; Errors ; Plotting ; Co-ordinates, checks ; permissible error ; adjustment of errors ; open traverse ; application to engineering problems ; areas ; accurate traverses.

N. B. Practical tests or tests in field work will be conducted by the College at the end of each year.

## Building Materials and Construction.

### A. MATERIALS.

**PAINTS AND VARNISHES.** Ingredients of paints—Litharge—Turpentine—Linseed oil—Mixing paint—Painting old and new work, wood-work and iron work—Painting walls—wood oil—Coal tar—Distemper—Varnish—Papering—Putty—Glazing.

**REINFORCED CONCRETE.** Nature, uses, properties, advantages, and disadvantages of Reinforced concrete over other types of construction. Formwork—Bending, tying and placing of reinforcements—Mixing concrete—Slump test—Laying and consolidating concrete—Striking formwork—Finishing of the R. C. C. surfaces—Strength of R. C. C.

### B. CONSTRUCTION.

**FOUNDATIONS.** Piles—Varieties, methods of driving and pile formulae—Sheet piles and coffer dams—well foundations—Brick and iron Wells—Mode of sinking wells—Excavating and dredging.

**MACHINERY.** Grillage foundation and underpinning—Box Caisson—open caissons—Timber and steel pneumatic caissons—concrete monoliths—cylinders and cylinder sinking.

**CARPENTRY AND JOINERY.** Stairs, Designing and setting out, panelling, etc.—Shoring, underpinning and timbering for shafts, tunnels and large excavations.

**BRICKWORK.** Vaults and domes—Flues and fire places—fire resisting construction.

**ROOFS AND FLOORS.** Terrace roofs and floors of joists, beams and joists or iron girders and joists—Bengal terrace roofs—Fire proof floors—Brick arched roofs—Pitched roofs—Couplage—Trusses—Rafters purlins and reepers—Roof coverings of thatch, tiles, slates, and shingles—Ceiling—Floors of stone, brick, tiles, concrete, timber, and asphalt,—single, double and framed timber floors—Wood and composite roof trusses—Simple forms of iron roof—Use of tee, angle and channel iron in compression and of rods and flat bars in tension—joints and connections. Shoes and bolts. Iron and timber purlins—Brackets—Patent roofing tiles—Corrugated iron, lead and Zinc roofing—Modes of attachment.

**STEELWORK.** Details of structural steel work in buildings and bridges i. e., beams, girders, columns, roof trusses, plate girders and lattice girders.

## Engineering Drawing.

### A. BUILDING DRAWING.

Floors, Roof frames and details of joints Stairs—General and detailed working drawings from sketches and specifications of building as residences, offices, schools etc.,

## Strength of Materials.

**DEFLECTION OF BEAMS.** Propped beams—Deflection and slope from bending Moment diagrams, with applications—Other graphical Methods—Beams of varying cross section—Carriage springs.

**BUILT IN AND CONTINUOUS BEAMS.**—Simple cases.—Effect of fixed ends—Symmetrical Loading—any loading.—Varying section. —Theorem of Three moments. Simple and general cases—Advantages and disadvantages of continuous beams.

**SECONDARY EFFECTS OF BENDING.** Resilience of beams—Deflections from resilience—Carriage springs—Impacts producing flexure—Transverse curvature. Shearing resilience and deflections due to shearing.

**DIRECT AND BENDING STRESSES.** Combined bending and direct stress. Eccentric loads—Pillars, columns and struts—Euler's theory—Use of Euler's formulae—

**THEORY OF STRUCTURES.**—Earth pressure, Rankine's Theory—Gravitated constructions—Wedge Theory—Resistance and stability of masonry, brickwork, etc.—Foundations—Footings—Grillage foundations—Resistance of retaining walls—Masonry Dams—Pressure of water—Lines of resistance—Design of section of dam—The three hinged arch.

**TWISTING.** Combined bending and torsion—Effect of end thrust—Torsion beyond elastic limit—Torsional resilience.—Open coiled helical spring.

**PIRES, CYLINDERS AND DISCS.** Thick cylinders—Dimensions for tubes and cylinders. Collapse of Tubes.—Thick spherical shell.—Compound cylinders—Press fits on solid shafts.—Wire wound tubes—Rotating ring or wheel rim.

**VIBRATIONS AND CRITICAL SPEEDS.** Elastic vibrations—Free vibrations—critical frequency—Dangerous speeds—Longitudinal vibrations—Transverse vibrations—Loaded and unloaded rods—Whirling speeds of shafts—Stress and deflection.—Vibrations of rotating shaft—Effect of end thrust and twist—Torsional vibrations.

## Hydraulics.

General principles of hydrostatics, static pressure, pressure on immersed surfaces, total pressure, centre of pressure, of laminae immersed in water and inclined to the vertical plane, problems on locked gates and sluices; equilibrium, metacentre. To find the metacentric height for regular figures.

**Fluids in motion :—**Stream line and turbulent motions. Bernoulli's theorem, pressure and Velocity of water, Venturimeter. Loss due to sudden expansion and contraction. Flow through converging and diverging pipes. Discharge from small orifices. Borda's mouth piece, running free and full.

Discharge from large orifices under constant and varying heads. Standard conditions. Coefficients of contractions, velocity and discharge. Velocity of approach. Effects of sudden expansion and contraction. Mouth pieces—Jets. Time required for emptying vessels. Discharge from large orifices. Completely submerged or partially submerged orifice.

**Weirs.** Triangular, rectangular, trapezoidal; velocity of approach-free and submerged discharge; standard conditions. Height of sill stability of nappe, gauging weirs, sluices, standing wave.

**Flow through pipes :—**Laws of fluid friction, hydraulic gradients, velocities in pipes, Viscosity. Critical velocity. Chezy D'arcy and Kutter formulae. Effect of bends, elbows, and valves. Variation of velocity in cross section. Syphons, Hammer action.

**Flow in open channels :—**discharge; influence of form on velocity; variations of velocity in vertical and horizontal cross sections. Bazin and Kutter formulae. Best form of channels.

**Gauging of discharge.** Methods and instruments used.

## Heat Engines.

**Heat reception and entropy—**Construction of Mollier's diagrams. Entropy of Steam. Total heat, Temperature entropy and pressure volume diagrams.

Internal energy and external work by steam, superheated steam, measurement of dryness by throttling calorimeter.

Theory of steam engines: Perfect steam engine working on Carnot's cycle. Rankine's cycle for dry saturated and superheated steam. Diagram of work. Steam consumption calculated from Indicator diagram. Effect of clearance expansion, and compression on steam consumption. Relation between steam consumption and power. Willan's line. Indicated and Brake Horse Power. Diagram factor. Effect of superheated steam, valve leakages jacketing and ratio of expansion. Modifications of theoretical Indicator diagram in practice. Effect of speed on Indicator diagrams. Indicated steam and missing quantities. Saturation curve on Indicator diagram. Interchange of heat between expanding steam and cylinder walls.

Internal combustion engines. Constant pressure and constant volume cycles. The Diesel cycle and the otto 4 stroke cycle. Effects of compression. General description and working of 4 stroke and 2 stroke engines, indicator diagrams. General principles of working gas, petrol, and oil engines. Gas producer. Vaporisers. Suction gas plant. Carburetters, oil pumps and injectors.

### ELECTRICAL TECHNOLOGY.

#### D. C.

Direct current motor. Principles, different types, starting and speed control.

Testing of direct current machines: Types of tests, Direct test, Swintarnes test, Hopkinson test and field's test for series machines.

General study of distribution: various system. Use of booster, and balancers. Calculation of feeders and net works.

Illumination Engineering. Definitions of terms involved. Laws of illumination Lumines Brodhum Photometers. Illumination calculations. Incandescent lamps, Mercury vapour lamps and Sodium vapour lamps.

#### A. D.

TRANSFORMERS. Theory and construction. Equivalent resistance and reaction Regulation. Efficiency and losses: Polyphase transformers. Testing of transformers. Methods of cooling. The auto-transformer.

THE ALTERNATOR. Construction and theory. Single phase and polyphase windings. Voltage equation. Armature reaction.

THE SYNCHRONOUS MOTOR. Theory and power factor improvement. V curves. Synchronising and parallel operation of alternators.

THE INDUCTION MOTOR. Theory of operation. Squirrel cage and wound motor types. Speed control and methods of starting.

ELECTRICAL MEASURING INSTRUMENTS. A short study of the various types of commercial instruments.

### DOCKS AND HARBOURS.

Physical geography in relation to docks and harbours—natural phenomena—prevalence and intensity of winds—coastal change—accretion and denudation—effect of artificial interference—tidal phenomena—Waves—form, height and length—wave velocity and wave action.

Objects of docks and harbours—Considerations affecting choice of site—entrances to docks and harbours—foreshore protection and channel regulation—wet, dry and floating docks—tidal basins and harbours—different forms and types—details and methods of construction—Lock gates, their construction and working—machinery employed. Different types of quay walls—their constructions and maintenance—signals and light houses—ferries and landing piers—Description of important existing docks and harbours. Latest advancements in dock and harbour engineering.

N. B. Questions will be confined to theory and not to detailed design).

## SURVEYING. (Only Practical)

**TRAVERSE SURVEYING.** Theodolite and chain—Theodolite and Stadia—Plotting by protractor by co-ordinates—Adjustment of different types of Theodolites—Determination of heights and distances with the theodolite. Tacheometry and theory of the Anallatic lens.

**SETTING OUT CURVES.** Simple, Compound and transition curves—Vertical curves—Curve ranger. Tacheometry and theory of the Anallatic lens.

**MINOR TRIANGULATION.** Minor triangulation—choice of stations—adjusting the angles—signals—conducting the Survey—vertical angle—Problems in triangulation.

N. B. Practical tests or test in field work will be conducted by the University at the end of the third year. The test will cover the courses in the first three years.

## THEORY OF MACHINES.

**HIGHER PAIRS.** Toothed gearing, trains of wheels—Value of trains, change wheels for lathes. Annular wheels. Bevel wheels. Epicyclic trains. Form of wheel teeth. Velocity of sliding. Rolling circle, and shape of tooth. Involute teeth. Helical teeth. Screw motion—Worm gearing. Humpage gear. Rolling friction.

**CAMS.** Offset and straight sided Cams. Cam with swinging link. Cam driving a flat plate. (For drawing work).

**FRICTION.** Laws of solid friction, sliding friction, limiting angle. Friction circles. Michell thrust block. Pivots, conical and flat.

**THEORY OF LUBRICATION.** Michell bearings, Ball and roller bearings.

Hookes joints. Belts, maximum power transmitted by belt, centrifugal tension. Rope drive. Static equilibrium of machines. Brakes and dynamometers.

## WORKSHOP APPLIANCES AND PRACTICE.

Standards of measurement. Measuring instruments. Pratt and Whitney and Witworth measuring machines. Thread measurement—three wire system of root diameter.

**MEASURING TOOLS.** Outside and internal micrometers. Vernier calipers. Measurement of tapers. Depth Gauges. Gear-teeth calliper, Dial gauge Gauges. The Newall system: Allowance, tolerance and limits. Force, driving, push and running fits. Use of block gauges. Standard calliper, plug and ring gauges. Single ended and double ended limit gauges. Standard screw gauges. Limit core and full diameter gauges. Limit screw gauges. Adjustable external screw gauges.

**COMMON SHOP TOOLS.** Outside and inside callipers, transfer callipers, thread callipers, dividers, straight edges, Try squares, punches, scribbling blocks. Universal surface gauge, combination bevel gauge, Taper and radius gauges. Spirit level, screw thread gauge, screw cutting gauge. Bench work, types of dies and clamps, types of hammers and chisels. Files and scrapers. Key way cutting and key fitting—Reamers. Drifting and broaching, method of marking work.

**WORKSHOP PRACTICE.** General description of general purpose, lathe, details of head stock, back gear carriage, apron, tail stock, counter shaft, chuck, of an ordinary lathe. Screw cutting and feed motions, common lathe tools and tool holders. Correct positions for lathe tools, cutting speeds and feeds. Use of milling machine plain, vertical and universal. Types of cutters. Boring and slotting machines—their uses. Boring tools. Planning, shaping and drilling and grinding.

**FOUNDRY PRACTICE.** Pattern making and core box. Moulding sand—green sand, dry sand loam moulding, core machines, cores for pipes and cylindrical objects. Cupolas.

## Electrical Machines.

**DIRECT CURRENT MACHINERY.** Constructional details of direct current machines, calculations and measurements connected with the magnetic circuit. Details of construction and design of shunt and series field magnet coils. Armature windings. Armature reaction, use of interpoles and compensating windings commutation and commutator reactance voltage design of interpoles.

Losses, efficiency and testing of d. c. machines characteristic of d. c. generator.

Direct current motor : shunt, series and compound. Application. Torque and speed equations.

## ALTERNATING CURRENT MACHINERY.

Single and polyphase alternators. Details of poles stator windings. E. M. F. equation waveform, Armature reaction calculation of regulation. Parallel operation of alternators. Testing of alternators. Efficiency.

Synchronous motors ; V-curves applications. Hunting. Methods of starting.

## Electrical Measurements and Measuring Instruments.

Electrical units and standards. Derivation of C. G. S. electrostatic and electromagnetic units and their dimensions. International units and standards. Absolute measurement of International ampere and ohm.

Symbolic vector methods and complex quantities and their application to practical cases i. e. polyphase currents and alternating current net works.

General classification and principles of operation of measuring instruments : control, damping bearings, sensitivity and accuracy.

Theory, construction, errors and accuracy of Hot wire, moving iron, moving coil, dynamometer and Induction type commercial instruments ; Electrostatic voltmeters, single vane and multivane types. Ranges of ammeters and voltmeters. Current and potential transformers.

**WATT HOUR METERS.** General principles, classification, component, breaking, Motor-type meters, commutator type, Mercury motor type and Induction type. Errors, compensation and applications. Testing Galvanometer, Direct current galvanometer, Tangent galvanometer, D'Arsonval galvanometer, Ballistic galvanometer, thermocouple galvanometer. (general study).

The wheats one bridge and potentiometer :—Standardisation of instruments A. C. potentiometer.

Measurement of high and low resistance.

Frequency meters. Power factor meters and oscillographs, Iron testing instruments. Ballistic tests, permeammeters, flux meter, Hysteresis tests.

Measurement of luminous flux, candle power and Illumination.

## FOURTH YEAR.

### B. Sc. ENGINEERING DEGREE EXAMINATION PART II.

### CIVIL ENGINEERING.

#### GROUP A. PAPER I.

#### THEORY OF STRUCTURES.

**THEORIES OF EARTH PRESSURE:**—Rankine's Theory with and without Surcharge—Wedge Theory—Winklers', Rebhann's and Neville's graphical Constructions—Proof and easy application of the generalised wedge theory.

**MOVING LOADS AND INFLUENCE LINES:** Curve of maximum bending moments and maximum shear forces—the enveloping parabola and determination of equivalent uniformly distributed load, influence lines for reaction—Shear force—Bending moment and deflection—Influence lines for forces in members of braced girders and spandril braced arches—Reversal of stress under live load.

**SUSPENSION BRIDGES AND ARCHES:**—Stresses in loaded cables and hanging chains—stiffening girders, moments and shears in such girders, elastic theory of the rigid arch—Eddy's Theorem—stresses due to rib shortening and temperature changes—Reactions and horizontal thrust in rigid, two hinged and three hinged arches—Reaction loci—lines of resistance through rigid and hinged arches under dead and live loading.

**STRUCTURAL FRAMES:**—Calculation and graphical determination of forces in members of roof trusses with kneebraces, in braced girders of variable depth with or without secondary members and in trestles—Displacement diagrams for braced girders—analysis of simple types of indeterminate frames—Portals and wind bracing—Secondary stresses—Swing bridges—Deficient and redundant frames in 2 and 3 dimensions—Theory of Least work.

## GROUP A. PAPER II.

### THEORY OF STRUCTURES.

#### (a) STRUCTURAL STEELWORK AND WOODWORK.

**BEAMS AND GIRDERS:** Properties of British standard sections—Detailed design of beams—Compound girders and built up web plate girders in steel and wood—Limiting spans and economical depths. Design of flanges and webs in steel and wood—Curtailement of flange plates—Determination of size, pitch and arrangement of rivets in flanges and web—Types of stiffeners, their spacing and empirical rules therefor—Design of joints and connections—Detailed design of crane and gantry girders of built up plate and lattice girder types and typical details of construction.

**COLUMNS AND STRUTS.** Plain and built up sections—Assumptions regarding end conditions—Data and practical formulae for design—Detailed design of stanchion for buildings and compression members of roof trusses and lattice girders—Design and details of caps, bases and brackets for stanchions—Size, pitch and arrangement of rivets on flanges of plated stanchions—Column foundations—Design of plain and built up wooden columns for buildings and compression members in trusses.

**ROOF TRUSSES:**—Types of roof trusses in timber and steel—Limiting spans—Rise and Camber—Economical spacing—Data for design and practical rules—Detailed design of timber framed and steel framed sheds—Wind bracing on roof trusses—Details of joints and connections, other details of construction.

**(b) REINFORCED CONCRETE. GENERAL PRINCIPLES.** Theory and design of rectangular beams, slabs, and columns—Arrangements of laying reinforcement—Leading systems of reinforcement—Economical methods of construction—Design and details of formwork.

**BUILDINGS AND BRIDGES.** General Principles of design—Methods and details of construction—Detailed design of different types of buildings and highway bridges.

**TANKS AND COWERS.** General principles of design—Methods and details of construction—Detailed design of low and high tanks from specifications.

**RECTANGULAR WALLS.** Cantilever and Counterfort types—Their detailed design from specifications—Methods and details of construction.

**FOUNDATIONS.** Difficult foundations such as coffer dams—Well foundations cylinder foundations, cribwork and caissons and concrete monoliths—Details of construction and methods of working.

**MISCELLANEOUS STRUCTURES.** General principles relating to the design and construction of bunkers, gantries, domes, chimneys, hoppers, silos, jetties, pile and raft foundations.



## GROUP B. PAPER. I.

## IRRIGATION AND WATERWAYS.

**GENERAL.** Importance of Irrigation works—Productive and protective work projects—General principles of flow, lift, perennial, basin or inundation and well irrigation—principal crops—duty, factors affecting duty for crops under storage and direct flow irrigation—duty in Madras Systems—Rainfall and run off—Study of rainfall statistics—utility in run off calculations—flood discharge and its estimation—Percolation, Evaporation and absorption losses in canal and storage systems—Uplift and piping—Stability of works, affected by percolation—Silt analysis, Silting of reservoirs—flow in canals—Kennedys Critical Velocity and its applications.

**DIVERSION WORKS.** General description of rivers—river weirs—Selection of sites—types on permeable and impermeable soils—weir crest shutters—principles governing the design and construction of river regulators, head regulators, under sluices, flood banks, and protective works—Retrogression of levels.

**STORAGE WORKS.**—Selection of site—masonry dams—principles of design of gravity, arch and other types—uplift in masonry dams—drainage galleries—expansion joints—methods of construction—Earthen dams—Cause of failure—types of dams—materials for dams—methods of construction—drainage of earthen dams and foundations—component works—sluices, Surplus escapes—ordinary types—Stepped waste weirs syphon spill ways—Selection of sites—Plug sluices—Tanks isolated and rainfed—Single or in groups—Supply, capacity—Repairs to bunds and breaches, Flood absorptive capacity of reservoirs—Formulate for design of weirs.

**DISTRIBUTION SYSTEMS.** Design and alignment of canals—distributaries and sluices etc., in deltaic and non-deltaic countries—Capacity, command, limiting velocity etc—Drainage necessity, water logging, alkalinity of soils, drainage principles governing design of drainage channels, outfalls—lining of canals—General description, construction and design of masonry works on canals.—(a) for regulation of water level, rapids, falls or drops notches, escapes syphon well drops, sluices—(b) Cross drainage works and surplus works—aqueducts, syphon aqueducts super-passages, Level crossings, inlets and outlets (c) Communication works—road dams, fords etc.

**NAVIGATION CANALS.** Main features—Limit of velocity of flow—locks—Desirability of combining navigation and irrigation.

**RIVER TRAINING WORKS.** Spurs, groynes, bells, bunds, mattresses, aprons, etc.,

## GROUP B. PAPER II.

## SANITARY ENGINEERING AND WATER SUPPLY.

(a) **WATER SUPPLY. SOURCES OF SUPPLY.** Springs, wells, rivers and lakes—Selection of a suitable source—wells, geology, shallow, deep and artesian wells, construction, yield quality. **RIVERS.**—Trenches, infiltration gallery.

**STORAGE RESERVOIRS.** Site, capacity, compensation water, dams, form, design, construction, waste weirs, outlet conduits, valve tower.

**CONVEYANCE.** Hydraulic Gradient, types of aqueducts, syphons, air valves, balancing reservoirs, losses of head on straight pipes and at bends, elbows and tees. Discharge through long pipe lines, branch mains and multiple supply. Flow through bye-pass and pipes coupled in parallel.

**PUMPS AND PUMPING:** Pumps and suitability—Positive head and negative head on the pumps, pumping station—General types of pumping installations used in India.

**PURIFICATION.** Sedimentation, Coagulants, effects of storage on purification, infiltration galleries—Slow Filtration, Filter beds, area, size, arrangement of filtering media, material and construction, rate of flow, regulation cleaning, remarks. **RAPID FILTRATION** particularly suited for tropical countries—types of filters, rate of filtration, operation of mechanical filters—Sterilization by chlorine, Bleaching powder, perchloron, liquid chlorine, light and electricity, softening hardness in water—methods of softening.

**DISTRIBUTION.** Combined and dual systems, intermittent and constant supply mains and branches, methods of arranging distribution pipes, Zoning, sluice valves, scour valves, air valves, reflux or back pressure valves, relief valves, Hatch box and Hatch pipes. Watering posts, fire hydrants, taps, house fittings—Syphon, Pitot tubes, Pitometers, Water hammer—Surge valves—Minimum terminal pressure in the mains, minimum delivery pressure in the highest tap in house service and booster pumps. Service reservoirs—Waste detection and prevention.

**METERS,** Venturi meters, Mercury column and water column—Recorders—House service meters—degree of accuracy.

**TUBERCULATION AND INCRUSTATION OF WATER MAINS.** Scraping of water mains.

**SANITATION.** Ideal sites for various types of buildings and their orientation—Air space per person for various classes of buildings—Height of living rooms—Ventilation requirements and humidity—Sanitary fittings—Drainage pipes—Special junction pieces—Disconnecting and intercepting traps—(Fully, silt and grease trap) Absorption pits—Conservancy and water borne systems of domestic sewage—sanitation of special types for buildings such as infectious diseases, hospitals, meat markets, abattoirs, crematoria etc. Drain testing.

**TRADE EFFLUENTS.** Their treatments.

**DRAINAGE AND SEWERAGE.**—Rainfall—house drains, surface drains, underground sewers, combined, separate and partially separate systems of sewerage, Measurement of sewage flow—branch and main sewers design and construction of manholes and sewers—ventilation and cleansing—self cleansing velocity—excessive and inadequate falls—automatic flushing—lifting of sewage—pumps—ejectors, lifts, intercepting and outfall sewers and their ventilation—storm overflows—outfall into sea. **SEWAGE DISPOSAL**—character and composition of sewages—disposal on land—Broad irrigation—intermittent irrigation—Sewage sludge—utilisation as manure—disposal in the sea.

**BACTERIAL PURIFICATION.**—Contact beds—intermittent—and filtration—precipitation—septic tank—trickling filters—sludge—disposal of sludge—activated sludge—design of disposal works.

(c) **TOWN PLANNING.** General principles—Healthy and unhealthy areas—Town planning and Housing Acts and Regulations.—Reconstruction.

## GROUP C. PAPER I.

### ROADS, RAILWAYS AND BRIDGES.

(a) **ROADS.** Importance of roads—Classification of roads, preliminary investigation—Reconnaissance Surveys—Considerations affecting alignment—Obbligatory points—grade—ruling gradients—curves and widths—availability of Materials of construction—different types of roads and pavements—Methods of construction—Materials of construction—their tests, properties and specifications—Treatment of road surfaces—Subdrainage and surface drainage—Pipes, drains, gutter causeways and culverts—Section of roads, camber and crown formulae—hill roads—Construction and maintenance of embankments—repair of roads, guard rails road signs, side walks, curbs, railings—Arboriculture,—Rules for preparation of road projects—standard specifications for different types of roads—Machinery employed for construction, maintenance and cleansing—Latest advancement in highway engineering.

(b) **RAILWAY.** Importance of railways—Classification of railways—Preliminary investigations—Reconnaissance—Preliminary and location Surveys—Obbligatory points—Grades—Ruling Gradients—Curves and the gauge problem—valley, mountain and cross country routes.

Permanent way and track work, ballast, sleepers, rails—rail chairs, joint and fastenings—points and crossings—Details of construction—Different types of crossings—Formulae and practical rules for setting out—Construction and maintenance of track work—Creep of rails.

**Mechanics of Railway traction**—Compensation for curvature and gradient—Signal—their forms and uses, interlocking principles and mechanisms—Miscellaneous structures in station yards—Standard dimensions on Indian Railways.

**Rules for preparation of Railway projects**—Latest advancements in Railway Engineering.

(c) **TUNNELLING.** Tunnels—considerations favouring tunnel construction or open cut—Shafts for tunnels—Form of cross section of tunnels through different rocks—Methods of driving headings—Methods of timbering or strutting tunnels—Methods of opening out or breaking up headings—Drainage and ventilation of tunnels, Single versus double tunnels—tunnel linings—Drilling and Blasting Tools employed and explosive—used Subaqueous tunnels—Shield—tunneling. Tunneling between coffer dams—Tunneling under compressed air and tunneling with precast lengths—Brief particulars of important existing tunnels.

(d) **BRIDGE DATA OR DESIGN.** Practical rules for design—Waterway for bridges and economical spacing of piers—Provision for drainage—Design of piers and abutments, detailed design of highway or railway bridges of plate girder, lattice girder, timber girder trusses, arches, T beam and slab, bowstring girder and foot bridge types from specification—Details of construction—Economical proportions—Standard dimensions—minimum clearances and headroom—Different types of floors—Transverse and lateral bracing—end bearings—Provision for drainage—Other important details of construction relating to the design of Cantilever Suspension, Swing, Lift and Bascule bridges.

#### GROUP C. PAPER II.

##### SURVEYING.

**Levelling**—Hill contouring—ghat roads—Barometric heights—Effect of earth's curvature and refraction on levelling—Abneys level—Clinometer.

**ADDITIONAL INSTRUMENTS.** Scales, Sextants, Theodolites, Omnimeters, range finders, Precision levelling.

**GEODESY.** Spherical geometry and trigonometry—Errors of observation—Methods of least squares, Weighted observations—Convergence of Meridians—Setting out parallels of latitude.

**FIELD ASTRONOMY.** Definitions and principles. Approximate motion of sun and stars—Astronomical tables—Methods of calculations in determination of true meridian, latitude, and longitude, and time—Solar attachment.

**TACHEOMETRIC SURVEYING.** General principles—The Analytic lens—Sloping ground, methods of holding staff reduction of readings, direct reading instruments movable hairs, testing micrometers—field work, degree of accuracy, tacheometry with level or Theodolite field work.

**TRIANGULATION.** Minor triangulation, choice of stations, proportions of sides, adjustment of angles by trail and by method of least squares. Satellite stations intersected points, Calculation of Co-ordinates,—base line measurements and use, Reduction of measurements.

**HYDROGRAPHIC SURVEYING.** Sounding—Location of Sounding—Charting cross sections of streams and rivers.

**MISCELLANEOUS:** Maps and map making, Tides and tide reduction—Topographical surveying.

The written examination in surveying conducted by the University at the end of the fourth year shall cover the III and IV year syllabuses.

#### GROUP C. PAPER III.

##### ENGINEERING ECONOMICS AND ACCOUNTS.

**PART I.** Wealth, supply and demand, standard of living and the law of substitution, Money and credit, currency, exchange, paper currency and coinage. Gresham's law and exchange. Financial responsibility and control, limited companies, banks, monopolies, trust stock exchange, organisation of production, and

distribution, advertising, depreciation and valuation. General principles of management, division of functions, the human factor.

**PART II:—ACCOUNTS.** Book keeping including the journal, cash book, the ledger, purchases book and sales book, balancing, writing off, profit and loss accounts.

**PART III—LEGISLATION.** Workmen's Compensation and Payment of Wages Acts—Methods for prevention and settlement of disputes.

**PART IV—PROCEDURE AND ACCOUNTS IN REGARD TO THE EXECUTION OF CIVIL PUBLIC-WORKS.**

Stores (stock, tools and plant, materials at site, road materials, write back orders). Suspense and manufacture accounts. **MUSTER ROLL** (labour or daily reports), measurement and allocation, usage of materials, measurement books. **CONTRACTS**—tenders—Contract documents—Measurement of works and materials—Running of interim bills or contract certificates—trial contract certificates, cheques and letter of credit—**ESTIMATES**—Administrative, financial and technical sanctions, excess over estimates, Regularisation by work slip, deviation statements or revised estimates—supplemental estimates.

Permanent advance—contingent bills, Imprest work ledger—work abstracts, work register—Schedules of expenditure—Completion reports.

## MECHANICAL ENGINEERING.

### GROUP A. PAPER I.

#### HEAT ENGINES PAPER I.

**THEORY OF STEAM ENGINES.** Compound expansion, Compound engine with or without intermediate receiver. Combination of indicator diagrams from a compound engine. Ratio of cylinder volumes for a compound engine. Effect of compounding on efficiency. Regenerative cycles for simple and compound engines Reheat factor.

Governing of steam engines, simple and compound.

Combination of temperature, entropy pressure diagrams, steam consumption. Analysis of indicator diagrams.

Principal types of modern boilers. Cornish and Lancashire type with details of design and construction. Boiler shells, rivetted joints, gussets, stays, furnaces, domes, and grates etc.

Boiler draught. Height of chimney required to produce a given draught. Efficiency of a chimney. Expenditure of heat on chimney draught. Intensity of draught and rate of combustion. Heat losses in a boiler plant.

Flow of steam through orifices and nozzles—through a convergent and divergent nozzle, effect of friction in a nozzle. Heat transmission, Theory of injectors Diagram of velocities for a simple turbine—Action of steam on buckets of impulse turbine, Effect of friction—Efficiency of buckets—Details of the de Laval turbine, compound impulse turbines, reaction turbines, impulse reaction turbines. Flow of steam on blades of reaction turbines—Parson's reaction turbines. Difference between impulse and reaction turbines. Number of stages. Importance of condensation and vacuum in turbines and reciprocating engines.

### GROUP A. PAPER II.

#### HEAT ENGINES. PAPER II.

**THEORY OF COMPRESSORS.**—Single and multi-stage air compressors.

**THEORY OF MECHANICAL REFRIGERATION.**—Reversed heat engine as refrigerator—Cold air machines, coefficient of performance, Reversed hot air engine cycles—Refrigerators employing volatile fluid. Vapour absorption process and the ideal efficiency. Continuous and intermittent refrigeration.

Vapour compression process. Two stage throttling process. Choice of refrigerants.

**THEORY OF INTERNAL COMBUSTION ENGINES.** Comparison of Otto and Diesel cycles. The compression ignition or composite cycle—Formulae for the efficiency. Ratio of compression. Influence of permissible pressure. Actual and theoretical diagrams. Temperature—entropy diagrams. Actual and theoretical efficiencies. Heat losses, effect of water jackets, volumetric efficiency, Suction temperatures for gas and petrol engines. Compression and maximum temperature—Dissociation—Combustion of air and petrol mixtures.

**HEAT TRANSFER.** Laws of conduction, thin and thick walled tubes—General equation for conduction—steady conduction—transmission of heat through boiler plates and tubes.

**GOVERNORS,** Watt, Porter Hartnell. Controlling force, isochronism, hunting.

**BALANCING OF ENGINES.** Conditions for the complete balancing of an engine—Rotating parts, Reciprocating masses—weights with arms in different planes. Loco motive balancing. Hammerblow, swaying couple, Pitching couple, Rocking couple.

#### GROUP B. PAPER I.

##### HYDRAULIC MACHINERY.

Theory of turbines—impulses and reaction and their governing.

Pelton wheel—determination of vane angles and wheel diameters, efficiencies, Governing of pelton wheel, Surge tanks.

Centrifugal pumps—Vortex chambers, guide vanes, determination of leading dimensions.

Reciprocating pumps—Separation, air vessels, pump valves, loss of head due to friction.

Air lift pumps—their uses and general layout.

Hydraulic transmission—Its principles and uses. Hydraulic rams, presses, cranes, lifts, Froude's dynamometer, couplings, accumulators and intensifiers.

Dimensional Similarity (Elementary.)

#### GROUP B. PAPER II.

##### DESIGN OF POWER PLANTS.

Nature and characteristics of power to be developed, Steam electric, internal combustion electric, hydroelectric, and mechanical considerations as to the suitability of land, general layout, lighting, ventilation, transport equipment. Cooling tanks and towers. Special mechanical equipment of power plants. Features in structural design. Methods of transmission of power, belts, chains, shafts.

#### GROUP C. PAPER I.

##### WORKSHOP ADMINISTRATION.

**WORKSHOP ADMINISTRATION.**—Management and organisation, departmental and functional—Modern tendencies in factory organisations—charts, elimination of waste, personnel, recruitment and training of staff operatives. Time and piece rates—Incentives, profit, sharing and co-partnership.

**PLANNING AND ESTIMATING** :—Functions of planning department—Design and manufacture—jigs and tools—operation schedules—time and motion study—Records of progress—Control chart—tool room—job batch and mass production—Estimating.

**STORES** :—Materials required for service and production—Specifications and sources of supply—Inspection and control—Stock indents—Periodical requirements and accounting.

**MANUFACTURE** :—Designs—drawings—specifications and assembly tests—special instructions—Gauging and methods of inspections—standardisation.

**COSTING**, : Wages and materials—overheads—time-keeping—Cost books.

**SALE ORGANISATION AND TENDERING** :—Market study and price determination—expenses incidental to selling and margins of profit—conditions of contract servicing.

**GENERAL** :—Lay out of works, and lighting, ventilation, and power supply, transporting equipment—Local regulations and restrictions, communication facilities—availability of materials, labour—skilled—unskilled—location and co-ordination of various departments.

#### GROUP C. PAPER II.

### ELECTRICAL GENERATION AND DISTRIBUTION.

Same syllabus as for Electrical Generation and Distribution, Group B. Paper II, Electrical Engineering..

#### GROUP C. PAPER III.

### ENGINEERING ECONOMICS AND ACCOUNTS.

Same syllabus as for Engineering Economics and Accounts, Group C. Paper III, Civil Engineering.

### ELECTRICAL ENGINEERING.

#### GROUP A. PAPER 1.

### ELECTRICAL MACHINERY.

**DIRECT CURRENT MACHINERY**, calculation and measurement connected with the magnetic circuit, details of field magnet coils shunt, series and compound Armature reaction, use of interpoles and compensatory windings, Commutation and commutator, reactance voltage, design of interpoles. Losses and efficiency, the direct current motor, shunt, series and compound, Torque and speed equations, Applications, Losses and efficiency.

**ALTERNATING CURRENT MACHINERY**, Single, and Polyphase alternators. details of poles and windings, Stator windings, E. M. F. and coefficients, Wave form, Regulation Efficiency, Synchronous motors, V. curves, Applications. Methods of starting.

#### GROUP A. PAPER II.

### ELECTRICAL MACHINERY.

**ROTARY CONVERTER**. Voltage ratio, heating, converter connections, Methods of starting and voltage regulation.

Motor converter, Mercury arc rectifiers.

**TRANSFORMERS**—theory, constructional details, parallel operation, transformer connections, autotransformers, Testing, installation and maintenances of transformers, Induction regulator.

**POLYPHASE INDUCTION MOTORS**. circle diagram, Induction generator, Synchronous induction motor and phase advancers.

Three phase commutator motors, Single phase induction motors and single phase commutator motors.

#### GROUP B. PAPER I.

### ELECTRICAL TRANSMISSION.

Systems of transmission of electrical energy from generating station to sub station, Comparison of D. C. and A. C. Weights of copper used, efficiency, Determination of most economical system for a given case. Inductance and Capacity, single phase and three phase, Overhead construction, Insulators, Transposition Mechanical principles, Overhead lines.

Short transmission lines, Long transmission lines, Regulation and efficiency, Cables and their construction, Dielectrics and their properties, Grading of cables, Corona, Resonance and surges. Lightning protection, Restrictive and protective regulations, Protective devices and lightning arresters, Earthing.

## GROUP B.—PAPER II.

## ELECTRICAL GENERATION AND DISTRIBUTION.

Selection of site for a generating station, Choice of system, type of plant and size of units, cost of generation—Comparison of D. C. and A. C. systems—Choice of voltage and frequency—Equipment of station, auxiliaries.

Switchboards and switch gear—Sub-stations, equipment, Boosters, batteries, transformers, feeder regulators, rectifier, rotary converter. Regulating and protective devices. Synchronising and parallel running of machines, division of load, Load and diversity factors, tariffs, Systems of distribution of light and power, Voltage drop and current distribution in network, Size of conductor, Kelvin's law, and its limitations. Insulation, resistance of mains and net-work, localisation of faults, underground mains and their construction, joints and joint boxes.

## GROUP C.—PAPER I.

## ELECTRIC TRACTION.

Systems of operation for tramways and railways. D. C. tramways and trolley buses, Tramway and railway motors, construction and characteristics, Series parallel control, efficiency, Mechanics of traction, Estimation of power and energy required, Description of typical tramway system, and railway D. C. system. Multiple unit control.

Use of alternating current, Single phase motors, control and equipment, Board of Trade regulations, Regenerative control.

## GROUP C.—PAPER II.

## ELECTRICAL COMMUNICATIONS.

PRINCIPLES OF LINE TELEGRAPH AND TELEPHONY—General theory of propagation of telegraphic and telephonic currents along wires and cables—Laws governing the speed of working in long aerial, underground and submarine telegraph lines, theory of loaded telephone lines. Equivalent "T" and "Π" networks. Transmission Units.

General principles of the theory, design, and construction of instruments used, telegraphic and telephonic working, including valves, repeaters, and protective devices.

MACHINE TELEGRAPHY AND TELEPHONE SWITCHING. The Wheatstone automatic system, Baudot and other systems of multiple telegraphy. Manual and automatic telephone exchange systems and equipment. Principles of carrier telegraphy.

WIRELESS TELEGRAPHY. The generation of damped and undamped currents of radio frequencies, their conversion into electro-magnetic waves, and the propagation and reception of such waves. Modulation of electro-magnetic waves for telegraphic communication.

THEORY OF RESONANT CIRCUITS. Series and Parallel resonant circuits coupled circuits.

Radio direction finding.

DETECTING DEVICES. Crystal and Valve detection. Principles of the modern broadcast receiver.

Thermionic valve amplifier.

ACOUSTICS. Nature and measurement of sounds, plane and spherical waves. Characteristics of speech, music and noise, and their measurement, Acoustics of rooms, and studios. Acoustic control of reverberation and noise, electrical and mechanical recording of sounds and their reproduction. Sound reproducing systems. Articulation and distortion. Acoustics in telephony, and broadcasting.

TELEGRAPHY. Sounder, telegraph galvanometer, relays (polarised and non-polarised).

Simple telegraph systems—Single current and double current systems, (Simplex and Duplex).

## GROUP C. PAPER III.

## ENGINEERING ECONOMICS AND ACCOUNTS.

Same syllabus as for Engineering Economics and Accounts, Group C Paper III, Civil Engineering.

## DIPLOMA EXAMINATION IN ENGINEERING, 1ST YEAR.

## MATHEMATICS.

**PRACTICAL MATHEMATICS.** Simple surds; ratio and proportion; indices and logarithms; linear, quadratic and simultaneous equations; graphs of statistical data; graphical solution of linear equations, simultaneous equations in two variables; quadratic equations; Determination of laws from observed distribution by plotting on graph paper. Evaluation of formulae of engineering interest; Arithmetic and geometric progressions.

**PLANE TRIGONOMETRY:**—Measurement of angles in degrees and in radians. Definition of trigonometrical ratios of an angle and the graphical determination of these values; Setting out angles from given values of any ratio. Relationship among the ratios and determining all the others from any one of them, use of the tables of sine, cosine etc. Solution of right angled triangles by calculation and drawing. Simple applications to heights and distances. The addition and subtraction theorems:  $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$ .

Solution of simple trigonometrical equations.

Graphs of  $\sin X$ ,  $\cos X$  and  $\tan X$ .

**MENSURATION.** Area and perimeter of plane rectilinear figures, length of circumference and area of a circle. Area of the circle, a sector and a segment, area of the ellipse, areas and perimeters of similar figures.

Areas of irregular plane figures by Simpson's rule, surface and volume of prism, pyramid, cylinder, cone, sphere and ring.

## APPLIED MECHANICS.

Forces in a plane, concurrent, non-concurrent and parallel, composition and resolution of forces, parallelogram, triangle and polygon of forces, moment of a force about a point, Principle of moments, couples, levers, practical applications.

Centre of gravity of plane areas and regular solids.

Simple machines like screw, jack, rope pulley, inclined plane, wheel and axle etc.

Unit of work, work done by machines used for lifting, Efficiency, velocity ratio and mechanical advantage.

Friction. Laws, experiments and results.

Behaviour of materials subject to direct stress, modulus of elasticity.

Bending moments and shear force in the case of cantilevers and simply supported non-continuous beams under simple loading.

Speed, velocity, acceleration, momentum, force, power, work, simple problems on the above.

## Engineering Chemistry.

Elements, compounds, mixtures, methods of separation, laws of chemical combination. Equivalent and atomic weights. Densities of gases and their molecular weights. Symbols, formulae and equations. Solution, solubility. Hydrogen, oxygen, oxidation, reduction, water, chlorine, hydrogen chloride, chlorides.

Acids, bases, Equivalent weights of acids and bases; normality.

Sulphur, hydrogen sulphide, sulphur-dioxide, sulphurous acid and sulphuric acid, sulphates.

Nitrogen, ammonia, nitric acid.

Action of common metals on common acids.

Phosphoric acid.

Carbon, methane, acetylene, hydrocarbons; carbon monoxide, carbon-di-oxide, carbonic acid.



Products of distillation of wood and coal.

Methyl and ethyl alcohol.

Solid, liquid and gaseous fuel—calorific power.

Silica, and clay; silicates.

Refractory bricks.

Metallurgy, properties and uses of copper, zinc, tin, lead and iron, cast iron, steel, alloys.

Preparation of sodium hydroxide, sodium carbonate, sodium bicarbonate, sodium sulphate, ferrous sulphate, aluminium sulphate, and Potash; Alun, mortar, Portland cement, Plaster of Paris—"Setting."

Varnish and paints—Pigments.

Water—temporary and permanent hardness. Treatment for boiler feed.

### Laboratory Course.

1. Study of common processes—purification of water and common salt (removal of insoluble impurities).
2. Density of air and carbon dioxide.
3. The hydrogen equivalent of the metals.
4. Properties of chlorine and hydrogen chloride.
5. Properties of sulphuric and nitric acids.
6. Acids, alkalies, bases, salts, general properties.
7. Equivalent weight of caustic soda and sodium carbonate, given standard solutions and equivalent weight of HCl.
8. Estimation of hardness of water.
9. Simple tests for iron, lead, tin, copper and zinc in their simple compounds.
10. Simple tests for carbonates, chlorides, nitrates and soluble sulphates.

### Applied Physics.

**HEAT.** Thermometry—common types of thermometers, expansion of solids, liquids and gases, co-efficient of apparent and absolute expansions of liquids, constant volume and constant pressure gas thermometers, Charles' law, Absolute temperature, Heat as a quantity, Thermal units, Specific heat by method of mixture, change of state, laws of fusion and ebullition, vapour pressure, Saturated and unsaturated vapours, Hygrometry, Cloud, Mist, Fog and allied phenomena, Qualitative laws of convection, conduction and radiation and their general applications, Mechanical equivalent of heat and its determination by friction cone.

**LIGHT.** Sources of light, Law of inverse squares, Photometry, Laws of reflection and refraction at plane surfaces, Refraction through prisms, Total internal reflection, Experimental study of the law of distances of objects and images for converging and diverging lenses, Applications of the above to sextant, microscope, telescope and theodolites.

**MAGNETISM.** Magnets, temporary and permanent, Methods of magnetisation, The inverse square law, Unit pole strength, Lines of force and magnetic fields in simple cases, Magnetic moment, The earth's field, Dip and declination, Compass, Magnetic induction, the magnetic properties of iron and steel.

**ELECTRICITY.** Positive and negative charges, Conductors and insulators, Distribution of charge, Action of points, Qualitative ideas of potential and capacity.

Primary Cells, Local action and polarisation, Action of currents on magnets and magnets on currents, The E. M. unit of current and potential difference, Tangent Galvanometer, Moving Coil Galvanometer, Ammeter and Voltmeter, Ohm's law, Specific resistance,

Shunts, Combination of similar cells, Meter Bridge and Post Office Box, Potentiometer, Comparison of E. M. F.s, Heating effect, Joule's law, Applications, Electrolysis, Electro-chemical equivalent. Applications, Electro-magnets, Fundamental experiment on E. M. induction, and applications to Dynamos and Motors.

### Laboratory Course,

Vernier and Screw Gauge—Common Balance—Spring balance—Coefficient of linear expansion of a rod—Coefficient of apparent expansion of a liquid—Constant Volume Air Thermometer, Specific heat of a solid—Latent heat of fusion of ice—Latent heat of Steam—Hygrometry—Mechanical equivalent of heat—Photometry—Reflection at plane surfaces—Refraction through slab and prism—Focal lengths of lenses—Microscope and telescope—Plotting magnetic fields—Deflection magnetometer—Ampere's law, Study of Cells—Tangent Galvanometer—Metre bridge—Potentiometer—Joule's law—Reduction factor of a tangent galvanometer with copper voltameter.

## BUILDING MATERIALS AND CONSTRUCTION.

### Materials.

**STONE.** Varieties met with in Southern India including Travancore in particular—Quarrying—Blasting with powder and dynamite—Dressing—Average strength and weight of stone.

**BRICKS AND TILES.** Brick earth—Tempering, hand moulding, ground moulding, and table moulding—Machine moulding—Drying, burning in clamps and kilns—Wire cut bricks—Roofing and flooring tiles—Strength and weight of brick—characteristics of good bricks and tiles.

**LIME, CEMENT, MORTAR, CONCRETE, PLASTER.** Sources and properties of lime—Burning in intermittent and running kilns—slaking—Mortar mixing—Fat and hydraulic limes—Portland Cement—Hydraulic mortar—Sand—Surki—Concrete—Practical tests for limes and cements—Plaster and plastering—Pointing—White and Colour washing.

### Construction.

**MASONRY AND BRICKWORK.** Coursed and uncoursed rubble—Block in course—Ashlar—Bedding—String courses—copings—Licels Brick laying—English and Flemish bonds—Bond at angles of walls, in footings with offsets, between main and cross walls at door and window openings, and in circular pillars—Foundations and footings—Plinth damp proof course—thickness of main and cross walls—wall plates—wood bricks and plugs—openings for timber beams, for doors and windows—corbelling—Flat and relieving brick arches—use of dowels—joggles and cramps in stone, scaffolding.

**FOUNDATIONS.** Excavation—Masonry and concrete foundations—unequal settlement—unit weights of concrete, stone masonry and brick masonry—Pressure on soil under foundations—average bearing power of different soils—foundations on rock—good and bad soils—well foundations—setting out buildings from working plans.

**CARPENTRY AND JOINERY.** Mortise and tenon joint—Fishing and scarfing—Iron straps and bolts—simple roof frames, and nature of stress in the different members—Details of joints.

### SURVEYING.

**CHAIN SURVEYING.**—Instruments, Ranging and chaining lines, Errors in chaining. Reconnaissance and fixing stations. Field book. Obstacles in chaining, plotting and calculation of areas.

**COMPASS SURVEYING** :—The prismatic compass, its details. Bearings and angles. Magnetic variation. Methods of Reckoning bearings. Whole circles and quadrants. Application of compass surveying. Field book. Local attraction and its elimination. Plotting. Closing error.

**PLANE TABLE SURVEYING** :—Instruments required and their use. Setting the table. Fixing of position. Use of the Plane table.

#### ENGINEERING DRAWING.

**A. MACHINE DRAWING** :—Copying to scale, drawing of simple details of machines such as rivets, rivetted joints, bolts and nuts, keys, cotters etc.

**B. BUILDING DRAWING** :—Brick Masonry. Bond at angles of walls, between main and cross walls, pillars etc. Foundations and footings. Arches. Timber joints. Halving, lapping, notching. Joints in Door frames. Details of a king post truss.

#### PRACTICAL GEOMETRY.

**PRACTICAL PLANE GEOMETRY** :—Construction of triangles, quadrilaterals, and polygons from given data. Describing circles to satisfy given conditions—passing through given points, touching lines and circles. Drawing straight lines touching circles. Construction of figures similar to given figures. Proportional division of lines including third, fourth and mean proportionals, extreme and mean ratio. Plain and diagonal scales. Scale of chords. Drawing curves defined by simple conditions. Inscribing and describing rectilinear figures and circles within and about others.

**PRACTICAL SOLID GEOMETRY.** Plans, elevations and sections of simple geometrical solids, singly or in combination, in simple positions. Isometric projection. Development of surfaces. Projection of shadows, Intersection of surfaces, simple cases.

### DIPLOMA EXAMINATION 2ND YEAR.

#### Mathematics.

**TRIGONOMETRY.** Functions of compound angles (Continued from 1st year). Graphs of trigonometrical functions; easy trigonometrical equations; relations between the sides and angles of any triangle; solution of triangles in general; applications to problems in heights and distances. Lengths of radii of inscribed, escribed and circumscribed circles of a triangle in terms of the sides.

**MENSURATION.** Surface and volume of frusta of prisms, pyramids, cones and of sectors and segments of spheres; volume of wedges and prismoids; surfaces and volumes of similar solids, Volumes of irregular solids by Simpson's rule.

**CALCULUS.** An elementary study of infinitesimals and limits; differential coefficient as a rate measurer and as the slope of the tangent to the curve representing the functions; graphical determination of differential coefficients of functions; differential coefficient of the sum of any number of functions, product of any number of functions, and the quotient of two functions. Differential coefficient of a function of a function. Differential coefficients of simple standard functions. Applications of the differential coefficients to study the rates of variation of two related quantities of practical interest.

**PRACTICAL MATHEMATICS.** Applications of binomial theorem to evaluate square root of 99, cube root of 1001 etc.

Principles and practice of the slide rule.\*

## Strength of Materials.

Elementary study of beams; Bending moment and Shearing Force (Continued). Sections in iron, steel and wood—Theory of simple bending proofs and simple applications of formulæ; Section Modulus figures.

Strength of riveted joints (Start) Thin Cylinders—Stresses and Strains in thin shells subject to internal pressure.

Work and resistance; Elastic moduli and Poisson's ratio; Relation between elastic constants.

Calculation and graphical determination of areas, position of centroid and neutral axis, moments of inertia, and radii of gyration with special reference to structural shapes.

Graphical determination of resultant of forces; Bow's notation; stresses in simple frames;

## Heat Engines.

Effect of heat on solids, liquids and gases. Units of heat and work. Work done by expanding fluid. Adiabatic and isothermal expansion and compression. Specific heats, gas constant, ideal heat engines. Thermal efficiency. Carnot's reversible cycle. Constant volume and constant pressure cycles, efficiency of a heat engine. Conditions for maximum thermal efficiency. 1st and 2nd laws of thermodynamics. Units of heat and their relations to units of work.

Fuels. Air required for perfect combustion. Calorific value calorimeters. Approximate method of finding weight of air supplied per lb. coal from feed water temperature.

Physical properties of steam. sensible and latent heat, total heat, absolute pressure.

Superheating. Wet steam, Dryness fraction.

General description of Lancashire, Cornish, Babcock Wilcox vertical boilers. Their important mountings. Working of a single cylinder steam engine with slide valve. Cut off, release, compression and admission, its indicator diagram.

## Hydraulics.

Physical properties of water, static pressure, centre of pressure. Total pressure on immersed surfaces. Stability.

Fluids in motion. Energy equation, Bernoulli's theorem and its application to the venturimeter. Stream line and turbulent motions, critical velocities. Pressure and velocity of water. Flow through converging pipes. Loss of energy due to sudden enlargement and sudden contraction of section.

Flow from small orifices, coefficient of an orifice.

Determination of coefficients. Distribution of pressure over side of a vessel containing orifice. Borda's mouthpiece. Submerged orifices, large orifices.

Flow over weirs rectangular and V notch. Types of nappes precautions in the use of weirs.

## Surveying.

PLANE TABLE SURVEYING:—Three and Two Point Problems.

THE TELESCOPE:—Principles; Refraction and curvature.

LEVELLING:—General Principles; Forms of field book; Types of levels; use and adjustments; fly levels; Reciprocal levelling; spot levels; Longitudinal and cross section levelling; Elementary principles of contouring on land and water.

THEODOLITE:—Universal instrument. Use of different types; Errors; Plotting; Co-ordinates, Checks; Permissible error; Adjustment of errors; Open traverse; Areas.

### Estimating.

Scope of subject—Main principles.—Ability to take out quantities for small brick and timber buildings and parts of buildings.

## ENGINEERING DRAWING.

### A. Machine Drawing.

Scale drawings of simple machine parts such as gun-metal bearings, stuffing boxes, Plans, Cross sections, Elevations, Rivetted joints.

### B. Building Drawing.

Roof frames of timber and details of joints, floors, detailed and working drawings from sketches and specifications of buildings such as residences and simple public buildings etc., with roof connections and details.

## BUILDING MATERIALS AND CONSTRUCTION.

### Materials.

**TIMBER.** Growth—Felling—Seasoning, natural and artificial—conversion—Preservation of timber—Varieties of timber used in Southern India and Travancore in particular—teak, congou or thambagam, karimaruthu (thembaroo) maruthu (vellamaruthu) vengai, ventekku, anjili, jack, red and white, cedar, pine, rosewood (thothakathy), casurina, mango, pa'myrah, cocoanut, bamboo—Strength and weight of timber—characteristics of good timber.

**METALS.** Pig iron—castings—Pipes and columns of cast iron—Strength of cast iron—Forms of wrought iron—Galvanised and corrugated iron—Strength of wrought iron—Rivets and bolts—Punching and drilling holes—Riveting—Welding steel, hard and mild—Strength of steel—Uses of copper, zinc, lead and tin as building materials—Alloys—soldering materials.

**PAINTS AND VARNISHES.** Ingredients of paint—Litharge—Turpentine—linseed oil—mixing paint—painting old and new work—wood oil—coal tar—varnish, putty—glazing.

**REINFORCED CONCRETE.** Elementary principles.

### Construction-

**MASONRY AND BRICK WORK.** Segmental and pointed brick arches—Centre for small arches—Bond in arches.

**CARPENTRY AND JOINERY.** Frames of timber and iron combined—Doors and windows—Ventilators.

**ROOFS AND FLOORS.** Terrace roofs and floors on joists, wooden beams and joists, or iron girders and joists—Bengal terrace roof—pitched roofs—couples—Trusses—Rafters, purlins and reapers—Roof coverings of thatch—tiles (ordinary pot and pan tiles and patent tiles). slates and shingles—Ceilings, wooden and tile—Floors of stone, brick tiles and concrete.

## ELECTRICAL ENGINEERING.

**DIRECT CURRENT.** Electrical and magnetical units. Electrical and magnetic properties of materials. Magnetic circuit. Calculation of ampere turns. Measurement of permeability. Hysteresis and eddy current losses. Power and energy. Cables. Resistance and drop of volts. Conductors and insulators. Insulation of wires and cables. The effect of moisture and heat on conductors and insulators.

**GENERATOR.** General description of its development—Lap and wave winding. E. M. F. equation. Armature reaction and its neutralization. Interpoles.

**ALTERNATING CURRENT.** Representation by sin wave and vector. Maximum, average and effective values. Form factor frequency. Addition of alternating quantities. Self induction. Rise and fall of current in inductive d. c. circuits. Self induction in a c. circuits. Skin effect. Resistance and self induction in series and parallel circuits. Inductive reactance impedance. Angle of lag. power factor, wattless currents. Capacitive reactance. Series and parallel circuits with resistance, inductance and capacity.

## DEPLOMA COURSE IN ENGINEERING THIRD YEAR.

### Mathematics.

Statement of the Binomial theorem. Its applications. The number 'e'. Expansion of  $e^x$ . Logarithms to base 'e'.

Differentiation of more difficult functions. Condition for the existence of maximum and minimum values. Application of differentiation for the determination of maximum and minimum values.

Integration as the inverse of differentiation and as a process of summation. Integration of a few elementary standard functions. Use of integration for determining areas, centre of gravity, centre of pressure, moments, inertia, areas and volumes of surfaces of revolution (very simple cases only).

Newton's laws of motion—Equations of motion in a straight line. The principle of the conservation of momentum and energy—An elementary study of projectiles and impact of bodies.

### Strength of Materials and Theory of Structures.

Behaviour of materials under test—Methods of testing and appliances used in determining the elastic constants and testing materials to destruction under tension, compression, shear, torsion and bending.

Stress Diagrams for framed structures like roof trusses with and without knee braces and braced girders of simple types—Section modulus figures, graphical determination of moment of inertia, modulus of section etc.

Deflection of beams—Relations of curvature, slope and deflection—Various simple cases.

Simple shear and torsion—Strength of shafts—close coiled helical spring.

Columns and struts—Formulæ of Rankine, Euler and Gordon (only application and not derivation).

### Heat Engines.

**STEAM ENGINE.** Effect of initial and back pressure and ratio of expansion. Steam jackets and super-heating and valve leakages. Mean effective pressure assuming steam as perfect gas. Steam consumption. Missing quantity.

Description of a double acting single expansion reciprocating steam engine. Slide valve. Lap and lead. Angle of advance.

Heat reception and entropy. Measurement of dryness. Throttling calorimeter.

Heights of chimneys. Governing and fly wheel.

**THEORY OF INTERNAL COMBUSTION ENGINES.** Principles of working—effect of compression, strength of mixture, speed, point of ignition ; gas producer.

### Electrical Technology.

Direct current. Principle and operation of direct current motors and generators. Speed control of D. C. motors. Characteristics of D. C. motors and generators. D. C. generators in parallel switch board diagram for compound generators in parallel.

Testing of direct current machines, direct and indirect methods, Separation of losses. Regenerative method.

Two wire and three wire systems of distribution. Use of boosters and balancers.

Electrolysis and secondary cells.

Brief study of Illumination Engineering.

Alternating current. Polyphase currents: two phase working. Balanced three phase working. Measurement of power and power factor.

TRANSFORMERS. General principle, construction, equivalent resistance and reactance. Efficiency and losses. Polyphase transformers. Testing of transformers. Methods of cooling. The autotransformer.

The alternator. Theory, voltage characteristic-

The synchronous motor. Theory and use for power factor improvement, V curves.

Synchronizing and parallel operation of Alternators.

The Induction motor: Theory of operation. Squirrel cage and wound motor. Speed control and methods of starting.

Electrical measuring instruments: A short study of the various types of commercial instruments.

### Hydraulics-

Flow of water in pipes. Fluid resistance. Losses in pipe lines. Hydraulic gradient. Velocity in pipe.

Syphons. Hydraulic gradient for syphons. Nozzle at the end of pipe line. Velocity of approach.

Transmission of hydraulic power at high pressures. Pipes in parallel.

Emptying a vessel through an orifice.

Flow over weirs. Bazin and Francis formulæ. Trapezoidal or Cipollettee weir. Conditions for standard weir.

Time to emptying a reservoir through a long pipe line.

Flow in open channels, discharge, influence of form on discharge.

Best form of channel. Ganguillet and Kutter formulæ.

General description of Hydraulic Press, Hydraulic Ram, Intensifier, Accumulator and Centrifugal and reciprocating pumps.

### Engineering Economics.

Evolution of industry. Development of machinery. Effect on labour, methods of transport and their effects on industry.

General principles of elementary Economics. Wealth, capital and income, Law of increasing returns, Law of demand and supply. Law of substitution. The stock exchange, monopoly. Rationalization.

Theory of money, Currency, Credit Banks.

Business organisation—Partnership. Joint Stock Companies. Principle of limited liability. Balance sheet. Private companies.

Forecasting and budgeting.

Value of statistics, charting for various departments such as sales, financial, accounting, production and labour. Theory of trade cycles, trade indices.

Budgeting for sales, production and finance departments.

General principles of contracting. Different types of contracts. Breach of contract. Types of agents, their duties. Sale of goods. Organisation of distribution, marketing, sales.

### Estimating.

Preparation of estimates for advanced types of buildings, road projects, tanks, etc.—General knowledge of the detailed data of the important items in the above estimates. Analysis of rates and estimating the cost of structures.

### Surveying (Theory).

**EARTHWORK AND CAPACITY OF RESERVOIRS:**—By contour lines and C. S. Levellings.

**CURVE RANGING:**—Definitions—Ranging straight lines with theodolite—Laying out curves by tangential angles—Worked example—Compound and Reverse curves—Transition curves—Vertical curves.

**NOTE.** (1) There will also be a practical examination.

(2) The University examination (theory) at the end of the 4th year will cover the above as well as the fourth year portions.

### Workshop Administration.

**FUNCTION OF MANAGEMENT.** Its division. Works manager and his duties.

**FACTORY ORGANISATION.** Types of organisation. Departments of planning and progress. Duties of Foreman. Wages and Specialisation. Labour.

**DESIGNING.** Factors affecting designs, standardization. Its objects and advantages. Quality control, accuracy, checking work. Inspection of materials and manufacture.

**PRODUCTION.** Its planning, costs and efficiency. Mass production, work of planning departments.

### Theory of Machines.

Motion Vectors, Speed, Velocity. Motion of a particle. Angular velocity and acceleration. Polygon of vectors. Centripetal force. Centre of gravity. Moment of inertia, radius of gyration. Kinetic energy, Potential energy. Conservation of energy. Inertia torque, angular velocities. Instantaneous centre.

Definition of Kinematic pairs, higher and lower pairs, sliding pair, turning pair, Kinematic chain, closed chain, mechanism, four bar chain. Inversion of four bar chain. Watts parallel motion. Slider crank chain. Pin and slot mechanism. Whitworth quick return motion. Donkey pump mechanism.

Straight line motions. Scott Russel straight line motion. Grasshopper motion in straight line. Copying mechanisms. Pantograph, Watts parallel motion. Thomson Indicator.

### Electrical measurement Instrument.

Electrical units and standards. General classification and principle of operation of measuring instruments. Control, damping, bearing sensitivity and accuracy.

Hot wire instruments: Ammeters and voltmeters.

Moving iron instruments: Ammeters and voltmeters. Attraction and repulsion instruments. Errors in moving iron instruments.

Moving coil instruments.

Ranges of ammeters and voltmeters.

Dynamometer instruments: Ammeters, voltmeter, wattmeter.

Induction instruments: Principle, Errors, Induction, ammeters, voltmeters and wattmeters.

Supply meters: General principle, classification, components, breaking, Motor type meters, commutator type. Mercury motor type, Induction type. Errors. Applications. Testing.

Ballistic galvanometers.

Measurement of high and low resistances.

Frequency meters and power factor meters.

Iron testing instruments: Ballistic tests, permeameter, Flux meter, Hysteresis tests.



## Electrical machinery.

**DIRECT CURRENT MACHINES.** Theory of direct current generator and motors, constructional details, operation, testing, analysis of losses.

**TRANSFORMERS.** General theory, heating, losses, efficiency, constructional details, operation and testing of transformers for efficiency and regulation.

## DIPLOMA EXAMINATION IN ENGINEERING, PART II—CIVIL BRANCH.

### GROUP A. PAPER I.

#### STRENGTH OF MATERIALS AND THEORY OF STRUCTURES.

Propped beams—Theory of fixed beams—B. M. S. F., Graphical determination of deflections—Graphical constructions for earth and water pressures and lines of resistance in retaining walls.

Theories of earth and water pressure—General conditions of stability—The middle third rule—Lines of resistance—Distribution of pressure on foundations and maximum intensities of pressure—Rankine's theory as applied to foundations.

Theory of a simple suspension bridge—Graphical determination of the line of pressure in a simple arch.

### GROUP A. PART II.

#### IRRIGATION.

Importance of irrigation works—Productive and protective works—General principles of flow, lift, perennial, basin or inundation, and well irrigation—Principal crops—Duty, factors affecting duty for crops under storage and direct flow irrigation—Duty in Madras systems—Rainfall and Run off—Flood discharge and its estimation—Percolation evaporation and absorption losses in canal and storage systems—Application of Kennedy's formula for critical velocity.

**DIVERSION WORKS.** Description of various works like river weirs, crest shutters, river regulators, head regulators, under sluices, flood banks and protective works.

**STORAGE WORKS.** Description of various types of simple dams—Earthen dams—Causes of failure—Types—Materials used—Methods of construction—Drainage and foundations—Description of sluices—Tanks, isolated and rainfed—Single or in groups—Repairs to bunds and breaches.

**DISTRIBUTION SYSTEMS.** General principles of construction of canals, distributaries and sluices in deltaic and non-deltaic countries. Drainage channels and outfalls. Description of simple masonry works on canals like drops, notches, escapes, sluices, aqueducts, syphon aqueducts, super passages, level crossings, inlets and outlets.

**NAVIGATION CANALS.** Main features. Locks.

**RIVER TRAINING WORKS.** Spurs, Groynes, bunds, mattresses and aprons.

### GROUP B. PAPER I.

#### WATER SUPPLY AND SANITARY ENGINEERING.

**SOURCES OF WATER.** Rain, springs, rivers, lakes, wells and infiltration gallery.

**STORAGE RESERVOIRS.** General principles—Storage capacity.

**CONVEYANCE.** Hydraulic gradient and types of aqueducts. Loss of head by friction.

**SERVICE RESERVOIRS.** Closed reservoirs. Water Towers and elevated tanks.  
(N. B.—Only general and brief descriptions.)

**PUMPS AND PURIFYING.** Purification. Sedimentation. Coagulants, types of pumps in use.

**SLOW FILTRATION.** Filter beds, area, size, etc. and arrangement of filtering media.

**RAPID FILTRATION.** Types of filters and their working.

**DISTRIBUTION.**

**STERILIZATION AND SOFTENING OF WATER—EXPLANATION AND FUNCTION.** Various systems of distribution and their component parts.

**REFUSE COLLECTION AND DISPOSAL.** Sanitary arrangements in houses—house, refuse, sullage—night soil—conservancy systems—collection and removal—disposal on land.

**EXPLANATION OF THE MAIN PRINCIPLES OF DRAINAGE AND SEWERAGE.** House drains, surface drains, underground sewers, combined, separate and partially separate systems of sewerage—Branch and main sewers—manholes, automatic flushing—Lifting of sewage—Pump, ejectors—Lift intercepting and outfall sewers—Storm overflows—Outfall into sea.

**EXPLANATION OF THE MAIN PRINCIPLES OF SEWAGE DISPOSAL ON LAND.** Broad irrigation—intermittent irrigation—sewage sludge, utilisation as manure—disposal in the sea.

## GROUP B. PAPER III.

### ROADS, BRIDGES AND EARTHWORK.

**ROADS.** Importance of roads. Classification of roads. Preliminary investigations. Reconnaissance surveys—Considerations affecting alignment—Obligatory points—Grades, ruling gradients—Curves and widths—Availability of materials of construction—Different types of roads and pavements—Methods of construction—Materials of construction—Treatment of road surfaces—Sub-drainage and surface drainage—Pipes drains, gutters, causeways and culverts—Section of roads—Camber and Crown formulæ—Hill roads—Construction and maintenance of embankments and cuttings—Repair of roads—Guard rails, road signs, side walks, curbs, railings—Machinery used for road construction—Standard specifications for different types of roads.

**RAILWAYS.** Importance of railways—Classification of railways—Reconnaissance—Preliminary and location surveys—Obligatory points—Grades—Ruling Gradients—Curves and the gauge problem—Permanent way and trackwork—Ballast, sleepers, rails, rail chairs, joints and fastenings—Points and crossings—Construction and maintenance of trackwork—Creep of rails—Super elevation, Signals, their forms and use, standard dimensions on Indian Railways.

**TUNNELLING.** Description of some common forms of simple tunnels.

**BRIDGES.** General principles of design of bridges and application of formulæ.

## GROUP C. PAPER I.

### SURVEYING (THEORY).

**LEVELLING.** Hill contouring—Ghat roads—Barometric heights—Effects of earth's curvature and refraction on levelling.

**ADDITIONAL INSTRUMENTS.** Scales, Sextants, Theodolites, Omnimeters, Range finders and Precision Levelling.

**TECHNOMETRIC SURVEYING.** General principles—The Analytic lens—Slopping ground—Methods of holding staff—Reduction of readings—Direct reading instruments—Movable hairs—Testing micrometers—Field work—Degree of accuracy—Tacheometry with level or theodolite—Field work.

**TRIANGULATION.** Minor triangulation—Choice of stations—Proportions of sides—Adjustment of angles by trial and by method of least squares, satellite stations—Intersected points—Calculation of co-ordinates. Base line measurements, and use—Reduction of measurements.

## GROUP C. PART II.

## REINFORCED CONCRETE AND STEEL WORK.

**STEEL WORK.** Beams and girders—properties of R. S. beams and built up sections—Design of beams, compound girder and built up web plate girders from Section Books.

**COLUMN and STRUTS.** Plain and built up sections—Data for design and practical formulæ for design—Column foundations.

**ROOF TRUSSES.** Types—Data for design and practical rules.

**REINFORCED CONCRETE.** Principles of R. C. C. design—data for design—Practical rules and formulæ for the design of simple rectangular beams, tee beams, slab and columns—arrangement of reinforcement and leading systems of reinforcement—simple designs of a building, a bridge, a tank and a retaining wall.

## MECHANICAL ENGINEERING.

## GROUP A. PAPER I.

## HEAT ENGINES.

Elements of the theory of steam turbines—flow of steam through nozzels and orifices.

Compression and absorption refrigerators.

**BOILERS.** Cornish, Lancashire, Locomotive vertical and water tube boilers mountings, feed pumps, superheaters, condensers, air pumps, cooling arrangement, oil, separators, Boiler room instruments.

**ENGINES.** Modern steam, gas and oil engines. Auxiliary machinery.

## GROUP A. PAPER II.

## STRENGTH OF MATERIALS AND THEORY OF STRUCTURES.

Same as that for Civil Branch, Group A, Paper I.

## GROUP B. PAPER I.

## THEORY OF MACHINES.

Joy's valve gear—Hook's joint. Higher pairing. Belt driving. Crossed drives. Open drives, Creep belts, Friction of ropes. Belt driving of non-parallel shafts. Reversing by means of belts—Train of wheels—Change wheels for a lathe. Annular wheels, bevel wheels, simple epicyclic wheels.

Teeth of wheels—Conditions for rolling, Involute, epicycloid or Hypocloid teeth—Pitch circle—Cycloidal teeth—Pin teeth—Rack with cycloidal teeth—Rack with radial teeth—Rack with pin teeth—Involute teeth on rack—Least number of teeth on a wheel—Stepped wheels—Helical gears—Proportions of teeth—Theory of Planimeter Friction—Rolling and sliding—Friction axis of link—Friction circle. Dead angle of steam engine mechanism.

Theory of lubrication.

Flywheel and Governor—Porter, Watt, Hartnell.

## GROUP B. PAPER II.

## HYDRAULICS AND HYDRAULIC MACHINERY.

Impulse of jets—Moving vanes—Graphical construction for the force exerted on a series of moving vanes.

Elements of the theory of Turbines.

General description of hydraulic machines such as turbines, Centrifugal pumps—Reciprocating pumps—Air vessels—Pelton wheel, Rams, Accumulators, Intensifiers, packings.

## GROUP C. PAPER I.

## MACHINE DESIGN.

Properties of materials of construction—Rivets and rivetted joints—Cottered and knuckle joints—Pipes and Flange joints for pipes—Shafts supports—Bearings, pedestal etc., Stuffing box—Steam engine parts, Piston, Piston rod etc.

## GROUP C. PAPER II.

## WORKSHOP APPLIANCES AND PRACTICE.

STANDARD OF MEASUREMENT. Measuring tools. Outside and internal micro-meters—Vernier callipers—Measurement of tapers—Depth-gauges. Dial gauge. The Newall system, allowance, tolerance and limits. Johansson system—Use of block gauges—Standard calliper, plug and ring gauges. Single ended and double ended limit gauges. Standard screw gauges. Limit screw gauges.

COMMON SHOP TOOLS. Outside and inside callipers—Try Squares, scribing blocks—Universal surface gauge—Combination bevel gauge, screw pitch gauges—Spirit level, screw cutting gauge.

BENCH WORK. Types of vices and clamps—types of hammers and chisels Files and scrapers—Keyway cutting and key fitting.

FOUNDRY PRACTICE. Pattern and core box—Moulding sand, green and dry sand, and loam mouldering core machine, Cores for pipes and cylindrical objects—Cupolas.

## ELECTRICAL ENGINEERING.

## GROUP A. PAPER I.

## ELECTRICAL MACHINERY.

Direct current generator. Lap and wave windings. E. M. F. equation, shunt, series and compound wound generators. Characteristics. Armature reaction, Interpoles and compensating windings. Commutation and sparkless operation. The direct current motor, shunt, series and compound wound, characteristics, torque and speed equations, applications, Losses and efficiency. No Load and Hopkinson tests for determining efficiency. Motor control apparatus. The alternating current generator, single and polyphase. Types of winding. E. M. F. equation, coefficients. Armature reaction. Regulation by E. M. F. and M. M. F. methods. Transformers, various types, principle of action. Induced E. M. F. equation. Regulation and efficiency by no load and short circuit tests. Auto transformers.

## GROUP A. PAPER II.

## ELECTRICAL MACHINERY.

Synchronous motor. Action and Vector diagram. Use as rotary condenser. Methods of starting. Polyphase induction motor, principle of action, slip, squirrel cage and slip ring types. Methods of starting. Circle diagram and results therefrom. Induction regulator. Single phase induction motor. Single phase series motor, repulsion motor. Methods of starting. Rotary converter. Ratio of d. c. to a. c. voltage. Principle of action, starting methods. Connections for six phase—Voltage regulation. Motor converter. Action and diagram of connections. Mercury arc rectifier. Principle of action, operation of six phase type.

## GROUP B.—PAPER I.

## ELECTRICAL GENERATION.

Selection of site for a generating station. Choice of System, type of plant, steam internal combustion and hydro-electric, size of units. Cost of generation Comparison of d. c. and a. c. Choice of voltage and frequency. Equipment of station.

AUXILIARIES. Switch boards and switch gear. Paralleling and running of d. c. generators. Synchronizing and parallel running of alternators, divisions of load. Load and diversity of factors, tariffs.

## GROUP B.—PAPER II.

## ELECTRICAL TRANSMISSION AND DISTRIBUTION.

Systems of transmission of electrical energy from generating station to sub-station. Comparison of d. c. and a. c., weights of copper used. Inductance and capacity of lines. Regulation and efficiency of short lines. Overhead construction, types of insulator. Corona effect at high pressures. Lightning protection.

Systems of distribution for light and power, voltage drop. Insulation—resistance of mains, location of faults.

## GROUP C.—PAPER I.

## ELECTRICAL TRACTION.

Systems of operation for tramways and railways. D. C. tramways and trolley buses, types of motor, construction and characteristics. Series parallel control, types of controller, efficiency, estimation of power required, multiple unit control for railways. Description of typical systems. Use of alternating current.

## GROUP C.—PAPER II.

## ELECTRICAL COMMUNICATION.

Principles of line Telegraphy. Systems in use, with description instruments and apparatus.

Principles of telephony. Manual and automatic telephone exchange systems and equipment. Radio communication. Resonance and tuning, damping coupled circuits. Aerials, Thermionic valves and their characteristics. Rectification, amplification, Transmitters, Receivers, transmission and reproduction of speech.

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# Appendix III.

## LIST OF SUCCESSFUL CANDIDATES—1942.

### Bachelors of Arts.

[N. B. Names in Italics denote women candidates.]

Sl. No.	Name of candidate.	Where Educated.	Optional Subjects	Second Language.	Class in which ranked.		
					Part I	Part II	Part III
1	Abraham, C. V.	U. C. College.	Economics and History	Malayalam	3	3	3
2	Abraham, K. V.	College and Private study.	do.	do.	3	3	3
3	Ali Kunju, K. P.	Arts College.	Philosophy	do.	3	3	2
4	Appukuttan, T.	U. C. College.	Economics and History	Hindi	3	3	3
5	Belakrishnan Nayar, N. K.	Arts College.	History and Economics	Malayalam	3	3	3
6	Belakrishnan Nayar, P. G.	U. C. College.	Economics and History	do.	3	1	3
7	<i>Benjamin, Mary</i>	College and Private study.	Economics and History	do.	3	3	3
8	Chandrasekharan Nayar, P. P.	S. B. College.	History and Economics	do.	3	3	3
9	Chandrasekharan Pillai, P. N.	U. C. College.	Economics and History	do.	3	3	3
10	Chellayyan, G.	College and Private study.	Philosophy	do.	3	3	2
11	Cheriyian, A. P.	S. B. College.	History and Economics	do.	3	3	3
12	Cheriyian, G.	U. C. College.	Economics and History	do.	3	3	3
13	Cyrus Britto, S.	College and Private study.	do.	do.	3	3	3
14	<i>Eapen, Accamma</i>	do.	History and Economics	do.	3	3	3
15	Eapen, P. E.	U. C. College.	do.	do.	3	3	3
16	Ennai, K. I.	do.	Economics and History	do.	3	3	3
17	Gangadaran, N.	College and Private study.	Philosophy	do.	3	3	1
18	<i>George, Alta</i>	do.	do.	do.	3	3	3
19	<i>George, A. A.</i>	Arts College.	History and Economics	do.	3	3	3
20	George, C. A.	U. C. College.	do.	do.	3	3	3

21	163	George, E. J.	U. C. College	Economics and History	Malayalam	3	3
22	186	George, M.	College and Private study	do.	do.	3	3
23	193	George, T. C.	S. B. College	do.	do.	3	3
24	34	Gopalakrishnan Tampi, K.	Arts College	History and Economics	do.	2	3
25	219	Gopinatha Menon, P. K.	S. B. College	Economics and History	do.	3	3
26	37	Gopinathan Nayar, V.	Arts College	History and Economics	do.	2	3
27	235	Hormise, T. P.	College and Private study	Economics and History	do.	3	3
28	137	<i>Ittycheria, Annamma V.</i>	do.	History and Economics	do.	3	3
29	90	Jacob Pereira, A.	do.	do.	do.	3	3
30	77	<i>Jacob, S. C.</i>	Arts College	do.	do.	3	3
31	39	<i>Jacob, V. P.</i>	do.	do.	do.	3	3
32	12	Josam, J.	do.	Philosophy	Tamil	3	3
33	217	Joseph, A. V.	S. B. College	Economics and History	Sanskrit	3	3
34	195	Joseph, C. M.	do.	do.	Malayalam	3	3
35	221	Joseph Chacko, V.	do.	do.	do.	3	2
36	197	Joseph, K. V.	do.	do.	do.	3	3
37	198	Joseph, N. J.	do.	do.	do.	3	3
38	199	Joseph, P. T.	do.	do.	do.	3	3
39	200	Joseph, P. V.	do.	do.	do.	3	3
40	215	Kanmakara Menon, K. G.	College and Private study	History and Economics	do.	3	3
41	42	Karunakaran Nayar, A.	Arts College	do.	Tamil	3	3
42	138	<i>Kaveri Ammal, P.</i>	College and Private study	Philosophy	do.	2	3
43	117	Kesari, J. S.	do.	History and Economics	Malayalam	3	3
44	44	Krishnakutti Menon, M. N.	Arts College	Economics and History	do.	3	3
45	169	Krishnan Namboori K. J.	U. C. College	do.	do.	3	3
46	99	Krishnan Nayar, K.	College and Private study	do.	do.	3	3
47	246	Krishna Pillai, K. K.	do.	do.	do.	3	3
48	91	Kumaran, K.	do.	History and Economics	do.	3	3
49	187	Kuriakose, A.	S. B. College	Economics and History	Sanskrit	2	3
50	170	Kuriyan, A.	U. C. College	do.	Malayalam	3	2
51	202	Kuriyan, P. V.	S. B. College	do.	do.	3	2
52	7	Kuriyan, K.	Arts College	Philosophy	do.	3	3
53	247	Luks, C. J.	College and Private study	Economics and History	do.	3	3
54	92	Madhavan Nayar, S.	do.	History and Economics	do.	3	3
55	109	Madhavan Nayar, M. N.	do.	do.	do.	3	3

**APPENDIX III,—(contd.)**  
**LIST OF SUCCESSFUL CANDIDATES—(1942)**  
**Bachelors of Arts.**  
*(N. B. Names in Italics denote Women Candidates.)*

Serial No.	Reg. No.	Name of candidate.	Where Educated.	Optional Subjects.	Second Language.	Class in which ranked.		
						Part I.	Part II.	Part III.
56	16	<i>Maha', Kunjammai</i>	Arts College	Philosophy	Malayalam	3	3	3
57	203	Mathai, K. K.	S. B. College	Economics and History	do.	3	3	3
58	204	Mathan, M. A.	do.	do.	do.	3	3	3
59	205	Mathai, T. V.	do.	do.	do.	3	3	3
60	183	<i>Mathew, Anamma</i>	U. C. College	do.	do.	2	3	2
61	173	Mathew, J.	do.	do.	do.	3	3	3
62	47	Mathew, K.	Arts College	History and Economics	do.	3	3	3
63	174	Mathew, M.	U. C. College	Economics and History	do.	3	3	3
64	249	Mathew, P. I.	College and Private Study	do.	do.	3	3	3
65	22	Mrthyunjan, K.	do.	Philosophy	do.	3	3	3
66	206	Narayana Ayyar, R.	S. B. College	Economics and History	do.	3	2	3
67	13	Narayana Ayyar, S.	Arts College	Philosophy	Tamil	3	3	3
68	48	Narayanan, G. K.	do.	Economics and History	Malayalam	3	3	3
69	225	Nilekantan, N.	S. B. College	Philosophy	do.	3	3	3
70	114	Nilekanta Pillai, B.	College and Private Study	do.	do.	3	3	3
71	17	<i>Ninan, Alayamma O.</i>	Arts College	Economics and History	do.	3	3	2
72	226	Ninan Varughese	S. B. College	do.	do.	3	3	3
73	104	Parameswaran Pillai, S.	College and Private Study	Malayalam with Sanskrit	do.	3	2	3
74	79	<i>Parukutti Amma, K.</i>	Arts College	History and Economics	do.	3	3	3
75	144	Paulose, A. K.	U. C. College	Philosophy	do.	3	3	2
76	250	Pilo, P. M.	College and Private Study	Economics and History	do.	3	3	3
77	86	Ponnen, P.	do.	History and Economics	do.	3	3	3
78	93	Ponnayyan, A.	do.	do.	do.	3	3	3



79	Polhen, Susan M.	College and Private Study	History and Economics	Malayalam	3	3	3
80	Purushothaman Pillai, P. G.	U. C. College	Economics and History	do.	3	3	3
81	Purushothaman Tampi, G.	College and Private Study	do.	do.	3	3	3
82	Raghava Kurup, C. K.	S. B. College	do.	do.	3	2	3
83	Raghavan Pillai, V.	Arts College	Malayalam with Sanskrit	do.	3	3	3
84	Rajamma, N.	U. C. College	History and Economics	do.	3	3	3
85	Ramachandra Ayyar, V.	College of Arts	do.	Sanskrit	2	3	3
86	Ramechandran Nayar, G.	do.	do.	Malayalam	3	3	3
87	Ramachandran Nayar, R.	do.	do.	do.	3	3	3
88	Ramakrishna Ayyar, M. V.	do.	do.	do.	3	3	3
89	Ramakrishna Pillai, K. N.	do.	do.	do.	3	3	3
90	Rama Varma, X. O.	do.	do.	do.	3	3	3
91	Sadasivan Pillai, M.	do.	do.	do.	3	3	3
92	Sadasivan Pillai, S. K.	College and Private Study	Philosophy	Tamil	3	3	2
93	Sankaran Nayar, P. K.	do.	Economics and History	Malayalam	3	3	3
94	Sankarasubrahmanya Ayyar, S.	S. B. College	do.	do.	3	3	2
95	Saragacathi Amma, K.	Arts College	Malayalam with Sanskrit	do.	3	2	2
96	Sarvothama Rao, P.	do.	Philosophy	Sanskrit	3	3	3
97	Sridharan, K. R.	College and Private Study	Economics and History	Malayalam	3	3	3
98	Sridharan Nayar, K. R.	do.	do.	do.	3	3	2
99	Srinivasan, M.	Arts College	History and Economics	do.	3	3	2
100	Srivallabha Menon, C. P.	U. C. College	Economics and History	do.	3	3	3
101	Subbiah Pillai, M.	College and Private Study	Malayalam with Sanskrit	do.	3	3	3
102	Sukumaran Nayar, P. K.	do.	History and Economics	do.	3	3	3
103	Swarna'atha, S.	Arts College	do.	Sanskrit	3	2	3
104	Thanka Nader, S.	do.	do.	Tamil	3	3	3
105	Thomas K. K.	S. B. College	Economics and History	Sanskrit	3	3	3
106	Thomas, K. T.	do.	do.	Malayalam	3	3	3
107	Thomas, M. T.	do.	do.	do.	3	2	1
108	Thomas, P. C.	do.	do.	do.	3	3	3
109	Thomas, P. J.	do.	do.	do.	3	2	3
110	Thomas, T. J.	College and Private Study	Philosophy	do.	3	3	3
111	Thomas, V. A.	do.	History and Economics	do.	3	3	3
112	Ummar Khan, A.	S. B. College	Economics and History	do.	3	2	3
113	Varadevan, K.	Arts College	History and Economics	do.	3	3	3
114	Varghese, K.	U. C. College	Economics and History	do.	3	3	3

**APPENDIX III—(contd).**  
**LIST OF SUCCESSFUL CANDIDATES—1942.**

**Bachelors of Arts.**

(N. B.—Names in Italics denote women Candidates.)

Roll No.	Reg. No.	Name and Candidate.	Where Educated.	Optional Subjects.	Second Language.	Class in which ranked.		
						Part I.	Part II.	Part III.
115	214	Varkey, V. J.	S. B. College	Economics and History.	Malayalam	3	2	3
116	66	Vasa Unnithan, K.	Arts College	History and Economics	do.	3	3	3
117	29	Venkitachalam Ayyar, K. A.	do.	do.	Sanskrit	3	3	3
118	135	Venkitaraman Pillai, P.	College and Private Study	Philosophy	Malayalam	3	3	3
119	139	<i>Visalakshi Ammal, A.</i>	do.	History and Economics	do.	3	3	3
120	71	Zacharia, P. V.	Arts College	do.	do.	3	3	3
121		Abraham, C.	do.	Appeared for the B. A. (Hons.) Degree Examination and was declared eligible for the B. A. Degree)				

# LIST OF SUCCESSFUL CANDIDATES—1942

## Bachelors of Science.

(N. B. Names in Italics denote Women Candidates.)

No.	Reg. No.	Name of Candidate.	Where Educated.	Optional Subjects.		Second Language.	Class in which ranked.		
				Main.	Subsidiary.		Part I.	Part II.	Part III.
1	38	Abraham Mathai.	College and Private Study	Mathematics	Chemistry	French	3	1	2
2	60	Abraham, M. G.	Science College	Physics	do.	Malayalam	3	3	2
3	61	Alexander, T. O.	do.	do.	do.	do.	3	3	2
4	228	Alexander V. O.	College and Private Study	Mathematics	Physics	do.	3	3	1
5	296	<i>Aley, T. J.</i>	U. C. College	Zoology	Botany	do.	3	3	3
6	195	<i>Akandathil Ammal, A.</i>	Science College	do.	do.	French	3	2	3
7	332	Avirah, N.	S. B. College	Chemistry	Physics	Malayalam	3	3	3
8	353	Balegopala Pillai, S.	College and Private Study	Botany	Zoology	do.	3	3	2
9	153	Balakrishnan Nayar, K.	Science College	Chemistry	Physics	do.	3	3	3
10	115	Bhaskaran, P.	do.	Physics	Chemistry	do.	3	3	3
11	62	Bhaskaran Nayar, A.	do	Chemistry	Physics	do.	3	3	2
12	179	Bhaskaran Nayar, V.	do.	Physics	Chemistry	do.	3	3	3
13	235	Brahmakrishna Nadar, M.	do.	Zoology	Botany	do.	3	2	2
14	298	Chacko, E. J.	College and Private Study	Botany	Zoology	Tamil	3	2	3
15	311	Chacko, M. C.	do.	Mathematics	Physics	Malayalam	3	3	3
16	134	<i>Chacko Mary, K.</i>	S. B. College	do.	do.	do.	3	3	3
17	12	Chandrasekharan Nayar, K. S.	Science College	Chemistry	do.	do.	3	3	3
18	275	Chandrasekharan Nayar, P.	do.	Mathematics	do.	do.	3	3	1
19	237	Chandrasekharan Nayar, V.	U. C. College	do.	Physics	do.	3	1	3
20	331	Chandrasekharan Nayar, V. N.	College and Private Study	Botany	Zoology	do.	3	3	2
21	268	Chandrasekharan Pillai, M. N.	S. B. College	Zoology	Botany	Sanskrit	3	3	3
22	180	<i>Chellappan, Mary.</i>	College and Private Study	Physics	Chemistry	Malayalam	3	3	3
23	250	Cheriyian, M. J.	Science College.	Zoology	Botany	do.	3	3	3
24	116	<i>Cheriyian, Thakamma C.</i>	College and Private Study	do.	do.	do.	3	3	3
		Cheriyian, T. I.	Science College.	Chemistry	Physics	do.	3	3	3

**Bachelors of Science.—(contd.)**  
*(N. B.—Names in Italics denote Women Candidates.)*

No.	Name of Candidate.	Where Educated.	Optional Subjects.		Class in which ranked.		
			Main.	Subsidiary.	Part I.	Part II.	Part III.
25	Chidambara Ayyar, H.	S. B. College	Mathematics	Chemistry	3	2	1
26	Chinnatampi, K.	College and Private Study	Physics	Physics	3	3	2
27	Daniel, D.	Science College	Chemistry	do.	3	3	3
28	<i>Daniel, Wilkie</i>	do.	Botany	Zoology	3	2	2
29	<i>Elizabeth, K. G.</i>	do.	Chemistry	Physics	3	2	2
30	<i>Fletcher, K. Amala.</i>	College and Private study	Botany	Zoology	3	3	3
31	Ganapathi Ayyar, K.	Science College.	Chemistry	Physics	3	3	1
32	Gangadaran Pillai, K. R.	College and Private Study	Physics	Chemistry	3	3	3
33	George Allen Moses Joseph	Science College	Zoology	Botany	3	3	3
34	George, C. J.	do.	Physics	Chemistry	3	3	3
35	George, K. C.	College and Private Study	do.	do.	3	3	3
36	George, K. N.	do.	Mathematics	do.	3	3	3
37	George, M.	do.	Zoology	Botany	3	3	3
38	George, V. M.	do.	Mathematics	Physics	3	3	3
39	<i>Gomathi Amma, M.</i>	Science College	Botany	Zoology	3	2	2
40	Gopalakrishna Kurup, R.	S. B. College	Zoology	Botany	3	1	2
41	Gopalakrishnan Nayar, M. R.	Science College	do.	do.	3	3	3
42	Gopala Menon, B.	College and Private Study	do.	do.	3	3	3
43	Gopinathan Nayar, C. P.	do.	Chemistry	Physics	3	3	3
44	Govindan Nayar, V.	do.	Zoology	Botany	3	3	2
45	Gregory, I. K.	do.	Mathematics	do.	3	3	3
46	Hariharasubramanya Ayyar, S.	do.	Physics	Chemistry	3	3	3
47	Ittycheriah, A. J.	do.	do.	do.	3	3	2

48	John, T. K.	312	S. B. College	Mathematics	Physics	Malayalam	1
49	John, V.	118	Science College	Chemistry	do.	do.	2
50	Joseph, A. M.	241	College and Private Study	Mathematics	do.	do.	3
51	Joseph, K. M.	213	S. B. College	do.	do.	do.	3
52	Joseph, M.	169	Science College	Botany	Zoology	do.	1
53	Joseph, P. J.	337	S. B. College	Zoology	Botany	do.	3
54	Joseph, Teresa.	306	College and Private Study	Botany	Zoology	do.	3
55	Joseph, T. J.	15	Science College	Mathematics	do.	do.	3
56	Kamalan, C. J.	83	do.	Physics	Chemistry	Tamil	3
57	Karunakaran, N.	242	College and Private Study	Chemistry	Physics	Malayalam	3
58	Kesava Pillai, N.	66	Science College	Physics	Chemistry	do.	3
59	Koohumohamed, K. M.	16	do.	Mathematics	Chemistry	do.	2
60	Krishnan Nambudiri, P.	3	Science College	Mathematics	do.	do.	3
61	Krishnan Nayar, K.	183	do.	Zoology	Sanskrit	Sanskrit	3
62	Krishnan Nayar, P. M.	243	College and Private Study	Physics	Botany	Malayalam	1
63	Krishna Pillai, N.	184	Science College	Zoology	Chemistry	do.	3
64	Krishna Panikkar, T. K.	356	College and Private Study	Mathematics	Botany	do.	3
65	Kumer, K. V.	67	Science College	Physics	Chemistry	do.	3
66	Kunjukunju, P.	279	U. C. College	Mathematics	Physics	do.	3
67	Kuriakose, K. K.	314	S. B. College	do.	Physics	do.	2
68	Kuriakose, K. I.	280	U. C. College	Chemistry	do.	do.	3
69	Kurien, E.	136	Science College	do.	Botany	do.	3
70	Kuriyan, C. V.	269	College and Private Study	Zoology	do.	French	2
71	Kurigan, Aloykutti.	244	do.	do.	do.	Tamil	2
72	Kuruvilla, M.	198	Science College	Physics	Chemistry	Malayalam	3
73	Kuttalam Pillai, T.	245	College and Private Study	do.	do.	do.	2
74	Madhavan Nayyar, K.	68	Science College	do.	do.	do.	3
75	Madhava Ayyar, S.	94	College and Private Study	Chemistry	Physics	Sanskrit	3
76	Madhava Ayyar, V.	108	Science College	Zoology	Botany	French	3
77	Maru Raj Sumanam.	45	College and Private Study	Mathematics	do.	Sanskrit	1
78	Mary, J.	194	Science College	do.	do.	Malayalam	3
79	Mathai, K. T.	316	S. B. College	Mathematics	Botany	do.	3
80	Mathai, M. M.	42	College and Private Study	do.	Zoology	do.	3
81	Mathew, Anna K.	168	Science College	Botany	Botany	do.	3
82	Mathew, K. E.	303	College and Private Study	Zoology	Botany	do.	3

# LIST OF SUCCESSFUL CANDIDATES—1942. Bachelors of Science.—(contd.)

(N. B.—Names in Italics denote Women Candidates.)

No.	Reg. No.	Name of Candidate.	Where Educated.	Optional Subjects.		Second Language	Class in which ranked.		
				Main	Subsidiary.		Part I.	Part II.	Part III.
83	70	Mathew, K. S.	Science College	Physics	Chemistry	Malayalam	3	3	2
84	309	Mathew Sebastian, M.	S. B. College	Mathematics	Zoology	Sanskrit	2	3	2
85	246	Meeress, M.	College and Private Study	Botany	Physics	Arabic	3	3	3
86	270	<i>Michael, Harbaramma.</i>	do.	Chemistry	do.	Malayalam	3	3	3
87	109	Narayana Ayyar, S.	Science College	do.	do.	Sanskrit	2	2	2
88	123	Narayana Ayyar, S.	do.	do.	do.	Malayalam	3	3	3
89	111	Narayana Kamath, A.	do.	do.	do.	French	3	3	3
90	342	Narayanan, R.	S. B. College	Zoology	Botany	Malayalam	3	3	3
91	247	Narayanan, S.	College and Private Study	Chemistry	Physics	Sanskrit	3	3	3
92	124	Narayanan Nambiyar, P. S.	Science College	do.	do.	Malayalam	3	3	1
93	248	Narayanan Nayar, A.	College and Private Study	Botany	Zoology	do.	3	3	2
94	177	Narayanan Nayar, K.	do.	do.	do.	do.	3	3	3
95	46	Narayanan Nayar, R.	Science College	Mathematics	Chemistry	do.	3	3	3
96	71	Narayanan Tampi, P.	do.	Physics	do.	do.	3	3	3
97	72	Narayana Pillai, K.	College and Private Study	do.	do.	do.	3	3	2
98	47	Natesan, N.	do.	Mathematics	Botany	Tamil	3	3	3
99	202	Northil, A. G.	do.	Zoology	do.	Sanskrit	3	3	3
100	249	Oliver, A. G.	do.	do.	Physics	Tamil	3	3	3
101	283	Omman, A. C.	U. C. College	Mathematics	Botany	Malayalam	3	3	3
102	260	Padmanabha Pillai, B.	College and Private Study	Zoology	Botany	Tamil	3	3	3
103	5	Padmanabha Ayyar, A.	Science College	Mathematics	Physics	Sanskrit	3	3	3
104	112	Padmanabha Ayyar, T. S.	do.	Chemistry	do.	French	3	1	3
105	12	Padmanabhan Chettiar, S.	College and Private Study	Botany	Zoology	Malayalam	3	3	3
106	100	Padmanabhan Nayar, R.	do.	Physics	Chemistry	do.	3	3	2
107	21	Padmanabha Panikkr, K.	Science College	Mathematics	Botany	do.	3	3	3
108	185	Padmanabha Pillai, T. G.	do.	Zoology	do.	do.	3	3	2

109	Parameswara Ayyar, R.	Science College	Zoology	Botany	Malayalam	3	1
110	Parameswaran Pillai, P.	College and Private Study	Mathematics	Physics	do.	3	3
111	Paroethu Pillai, A.	U. G. College	do.	Botany	do.	3	1
112	Parukutty Amma, N.	College and Private Study	Zoology	Chemistry	do.	3	3
113	Petrose, P. V.	Science College	Physics	Physics	do.	3	3
114	Phillip, A.	do.	Chemistry	Zoology	do.	3	2
115	Pothen, C. P.	do.	Botany	Physics	do.	3	3
116	Rabindran, K.	do.	Chemistry	do.	Sanskrit	3	1
117	Ragunandana Rao, R.	Science College	do.	Zoology	Tamil	3	1
118	Rajammal, K.	College and Private Study	Botany	Chemistry	Malayalam	3	3
119	Rajasekharan Nayar, S.	Science College	Physics	do.	Sanskrit	3	3
120	Ramankutty Nayar, P.	College and Private Study	do.	Botany	Malayalam	3	1
121	Raman Nambisan, P.	Science College	Zoology	do.	French	3	3
122	Rama Varma, P.	College and Private Study	Mathematics	Botany	do.	3	2
123	Ranga Ayyar, G.	do.	Zoology	Botany	Malayalam	3	1
124	Rebecca, E. T.	do.	do.	do.	French	3	3
125	Russel, S.	do.	do.	do.	do.	3	3
126	Sahasranama Ayyar, A.	do.	Mathematics	Chemistry	do.	3	3
127	Sankaran Nayar, K.	Science College	Physics	do.	French	3	2
128	Sankara Pillai, K.	do.	do.	do.	Malayalam	3	3
129	Sankara Wariyar, S.	College and Private Study	do.	do.	do.	3	2
130	Saraswathi Amma, K. R.	Science College	Botany	Zoology	do.	3	2
131	Sarajini Amma, C. P.	College and Private Study	Physics	Chemistry	Malayalam	3	3
132	Sebastian C. J.	S. B. College	Mathematics	do.	do.	3	3
133	Sitharama Ayyar, P.	College and Private Study	do.	Chemistry	Sanskrit	3	3
134	Sivasubrahmanya Ayyar, T. K.	Science College	Physics	do.	do.	3	3
135	Sridharan Nayar, G.	College and Private Study	Mathematics	Zoology	Malayalam	3	2
136	Sridhara Vedyar, R.	do.	Botany	do.	Sanskrit	3	3
137	Subrahmanya Ayyar, S.	do.	Mathematics	do.	Malayalam	3	3
138	Subrahmanya Ayyar, V.	Science College	Chemistry	do.	Sanskrit	3	2
139	Subrahmanyan, G. S.	College and Private Study	do.	Physics	French	3	3
140	Subrahmanyan, T. S.	do.	Mathematics	do.	Tamil	3	3
141	Subrahmanyan Moo hathu, S.	Science College	Chemistry	Physics	Sanskrit	3	3
142	Subrahmanyan Potti, P.	do.	Physics	Chemistry	Malayalam	3	2
					Sanskrit	3	3

**Bachelors of Science—(contd.)**  
*(N. B.—Names in Italics denote Women Candidates.)*

No.	Name of candidates.	Where Educated.	Optional Subjects.		Subject.	Class in which ranked.		
			Main.	Subsidiary.		Part I.	Part II.	Part III.
143	Sukumaran, M.	College and Private Study	Chemistry	Physics	Malayalam	3	3	3
144	Sydney, J.	do.	do.	do.	Tamil	3	3	3
145	Syed Mohamed Pillai, M.	Science College	Botany	Zoology	Malayalam	3	3	3
146	Tampi Jacob Jesudasan.	do.	do.	do.	Tamil	3	3	3
147	Thankamma, L.	do.	Chemistry	Physics	Malayalam	3	3	1
148	Thomas, C.	U. C. College	Mathematics	do.	do.	2	1	1
149	Thomas, C. M.	College and Private Study	Botany	Zoology	do.	3	3	3
150	Thomas, I. D.	Science College	do.	do.	do.	3	3	3
151	Thomas, P.	U. C. College	Mathematics	Physics	do.	3	3	3
152	Thomas, R. P.	Science College	Chemistry	do.	French	3	1	2
153	Varghese, I. D.	U. C. College	Mathematics	do.	Malayalam	3	3	3
154	Varghese, V. G.	do.	do.	do.	do	3	3	3
155	Varkey, K. J.	S. B. College	Mathematics	Physics	Sanskrit	3	3	2
156	Varghese, T. M.	U. C. College	do.	do.	Malayalam	3	2	3
157	Vasudevan Nayar, P. K.	Science College	do.	Chemistry	do.	3	1	3
158	Velayudhan Nayar, G.	College and Private Study	Physics	do.	Sanskrit	3	3	2
159	Velayudhan Nayar, K.	do.	do.	Physics	Malayalam	3	3	3
160	Velayudhan Nayar, R.	Science College	Chemistry	do.	do.	3	2	1
161	Venkatarama Ayyangar, K.	College and Private Study	Mathematics	do.	Sanskrit	3	3	2
162	Venkateswara Ayyar, K.	Science College	Chemistry	do.	do.	3	3	3
163	Viraghava Ayyar, S.	do.	Mathematics	do.	Malayalam	3	3	2
164	Viswanatha Ayyar, M. A.	do.	Chemistry	do.	do.	3	3	3
165	Wilfred, A. S.	College and Private Study	Physics	Chemistry	Tamil	3	3	3
166	Wilson, P. S.	Science College	Zoology	Botany	do.	3	3	3
167	Yousuff, O. S.	College and Private Study	do.	do.	Malayalam	3	3	3



### List of Successful Candidates—1942,

(N. B. Names in Capitals denote Women Candidates.)

#### M. A. DEGREE EXAMINATION.

S. No.	REG. No.	NAME OF CANDIDATE.	SUBJECT.	CLASS
1	7	BHAGIRATHI AMMA, J.	Sanskrit Language and Literature	3
2	2	ELIZABETH EAPEN	History and Economics	3
3	1	Joaquim, P. C.	do.	1
4	3	Kunaran, T. P.	English Language and Literature	3
5	4	Manjunath Bhat, M.	Sanskrit Language and Literature	2
6	5	Venkatasubrahmanya Ayyar, S.	do.	1
7	6	Venkateswara Sarma, K.	do.	1

#### M. Sc. DEGREE EXAMINATION.

1	1	Sivaswami Ayyar, R.	Mathematics	3
2	2	Thomas, V. P.	do.	3

#### B. A. (Honours) DEGREE EXAMINATION.

1	9	ABRAHAM, MARIAMMA	English Language and Literature	2
2	6	ALEXANDER, KUNJAMMA K.	History and Economics	2
3	11	BHAGIRATHI AMMA, A.	English Language and Literature	3
4	8	Chandy, K. M.	do.	3
5	19	Chellappan Pillai, C.	Sanskrit Language and Literature	2
6	22	Daniel, K. M.	Malayalam Language and Literature	2
7	7	DEVADAS, SUJANADAS	History and Economics	3
8	24	DEVAKIKUTTI AMMA, S.	Malayalam Language and Literature	3
9	12	GNANABHARANAM, GRISELDA	English Language and Literature	2
10	1	Govindankutti Nayar, M. G.	History and Economics	2
11	23	Krishna Pillai, C.	Malayalam Language and Literature	3
12	3	Lakshmana Ayyar, V.	History and Economics	1
13	20	Narayanan Nambudiri V. C.	Sanskrit Language and Literature	3
14	14	PADMINI BAI, G.	English Language and Literature	2
15	4	Ponnappan Nadar, R.	History and Economics	2
16	16	Raghava Kurup, C. G.	English Language and Literature	2
17	17	Ramakrishna Ayyar, A.	do.	1
18	18	Sankaran Nayar, K.	do.	3
19	21	Subrahmanya Ayyar, V. K.	Sanskrit Language and Literature	2
20	5	Sukumaran Nayar. V. K.	History and Economics	1

#### B. Sc. (Honours) DEGREE EXAMINATION.

1	1	Mammen, V.	Mathematics.	2
2	5	Philippose, P. P.	do.	2
3	2	Seshan, T. R.	do.	3
4	3	Sivatanumalayan, S.	do.	3
5	6	Subrahmanya Ayyar, K.	do.	2
6	4	Venkateswara Shenoi, K. S.	do.	1

## List of Successful Candidates.—1942

L. T. DEGREE EXAMINATION.

(N. B. Names in Capitals denote Women Candidates.)

No.	REG. NO.	NAME OF CANDIDATE.	OPTIONAL SUBJECTS.	CLASS.
1	58	Abdul Shakur, S.	Mathematics and Geography	3
2	48	Abraham, P. K.	Mathematics and Physical Science	3
3	49	Abraham, P. M.	do. do.	3
4	11	ALEY ALEXANDER	English and Physical Science	2
5	12	ALEYAMMA K. VARGESE	do. do.	3
6	57	ALEY V. JOSEPH	Mathematics and Physical Science	3
7	87	Antony K. Joseph	English and History	3
8	50	Balagangadhara Wariyar, S.	Mathematics and Physical Science	2
9	17	Balakrishna Pillai, M.	English and Natural Science	3
10	99	BHAGIRATHY AMMA, J.	Natural Science and Geography	3
11	22	BHARATI AMMA, C. P.	English and Natural Science	3
12	100	Bhaskaran, K. K.	History and Geography	3
13	23	CHACHY, K. U.	English and Natural Science	2
14	59	Chacko, P. N.	Mathematics and Geography	2
15	51	Damodaran Nayar, N.	Mathematics and Physical Science	3
16	29	Devassy, T. I.	English and History	3
17	30	Francis, K. M.	do. do.	3
18	31	George, P. K.	do. do.	2
19	4	Gopala Pillai, P. K.	English and Physical Science	3
20	52	Harihara Ayyar, M. A.	Mathematics and Physical Science	3
21	88	Iype, C. K.	English and History	3
22	85	Jacob, A. M.	English and Natural Science	3
23	5	Jacob, E. S.	English and Physical Science	3
24	6	John, C. K.	do. do.	3
25	67	John, J.	Natural Science and Geography	3
26	32	Joseph, K. C.	English and History	2
27	72	Joseph, M. J.	History and Geography	3
28	7	Joseph, P. T.	English and Physical Science	1
29	19	Joseph, T. C.	English and Natural Science	2
30	61	Kesava Ayyar, T. S.	Mathematics and Geography	3
31	73	Kesavan Nayar, K.	History and Geography	2
32	8	Krishna Das, C.	English and Physical Science	2
33	81	Kunjuraman Nayar, N.	English and Mathematics	3
34	33	Kumaravelu, S.	English and History	3
35	35	Kuriakose, N. M.	do. do.	2
36	98	MADHAVI AMMA, J.	Physical Science and Natural Science	3
37	36	Mani, V. D.	English and History	2
38	62	Manikkavasagan Pillai, T.K.	Mathematics and Geography	3
39	43	MARIAM JOSEPH, A.	English and History	3
40	13	MARGARET JOSEPH	English and Physical Science	3
41	14	MARY AMMAL, N. K.	do. do.	2
42	79	MARY FURTADO	History and Geography	3
43	101	Mathew, K. J.	do. do.	3
44	37	Mathew, M. M.	English and History	3
45	24	MOLLY JOHN	English and Natural Science	3
46	54	Narayanan, K. K.	Mathematics and Physical Science	3
47	74	Narayanan Nayar, K.	History and Geography	3
48	38	Oommen, C. S.	English and History	2
49	20	Padmanabha Aiyar, J.	English and Natural Science	3
50	55	Padmanabha Pillai, T. K.	Mathematics and Physical Science	3

(N. B. Names in Capitals denote Women Candidates.)

S. No.	REG. No.	NAME OF CANDIDATE.	OPTIONAL SUBJECTS.	CLASS.
51	39	Philip, C. P.	English and History	3
52	86	Philip, N.	English and Natural Science	3
53	9	Philipose, P. M.	English and Physical Science	3
54	44	PONNAMMA P. G.	English and History	3
55	75	Purushottama Kaimal, N.	History and Geography	3
56	83	Raja Raja Varma Thampuram, P. G.	English and Mathematics	3
57	1	Ratnasikhamani Nadar, S.	do. do.	2
58	76	Robert, P.	History and Geography	2
59	2	Sankara Pillai, P.	English and Mathematics	3
60	56	Sankaranarayana Ayyar, S.	Mathematics and Physical Science	3
61	77	Sankaranarayana Ayyar, V.	History and Geography	2
62	15	SARADAMMA, P	English and Physical Science	3
63	27	SHANMUGAVADIVU, M.	English and Natural Science	2
64	63	Sivathanu Pillai, A.	Mathematics and Geography	3
65	97	Sreedharan Pillai, K.	do. do.	3
66	68	Stephen, M. U.	Natural Science and Geography	3
67	69	Subrahmanya Ayyar, S.	do. do.	3
68	26	SOSA, A. JOSEPH	English and Natural Science	3
69	80	TERESA THOMAS, V.	History and Geography	3
70	10	Thomas, C. T.	English and Physical Science	3
71	3	Thomas, N. G.	English and Mathematics	2
72	47	Thomas, K. M.	English and Geography	3
73	78	Thomas, P. M.	History and Geography	3
74	95	Thomas, T- L.	Mathematics and Physical Science	3
75	64	Unnunni, T. T.	Physical Science and Natural Science	3
76	70	Varughese, A. G.	Natural Science and Geography	2
77	40	Varughese, M.	English and History	2
78	41	Verghese, N. M.	do. do.	3

## List of successful Candidates --1942:

## B. L. DEGREE EXAMINATION

(N. B. Names in Capitals denote Women Candidates.)

S. No.	REG. No.	NAME OF CANDIDATE.	CLASS IN WHICH RANKED.
1	1	Abraham, M.	2
2	2	Ananthan Pillai, K.	3
3	3	Ananthaswami Ayyar, B.	1
4	4	Bhagavatiswara Ayyar, S.	2
5	5	Chandrasekharan Nayar, K.	2
6	9	George, V. P.	1
7	11	Gopalakrishna Rao, A. P.	2
8	12	Gopala Pisharodi, K.	3
9	65	Govinda Pillai, V.	3
10	13	Harris, W.	3
11	14	Hormise, K. P.	3
12	15	Joseph, A. C.	3
13	16	Joseph, P. A.	2
14	19	Joseph, T. J.	2
15	20	Kumaran, M.	3
16	21	Kuncheria, K. K.	3
17	74	LEELA, P.	3
18	23	Madhavan Nayar, P. G.	2
19	24	Madhavan Nayar, S.	2
20	26	Mahadeva Ayyar, P. S.	2
21	68	Mahalingom Pillai, S.	3
22	28	Mathukutti, V. J.	3
23	29	Miravoo, K.	3
24	30	Muhammad Kannu, S.	2
25	32	Narayanan Tampi, V.	2
26	33	Padmanabha Sastri, K.	3
27	36	Raghava Kurup, N.	3
28	39	Rama Ayyangar, T. N.	3
29	40	Ramakrishnan, A. M.	2
30	41	Ramakrishna Pillai, N.	3
31	43	Raman Pillai, P. R.	2
32	44	Sankaranarayanan, R. V.	3
33	45	Sankaranarayanan, V.	3
34	47	Sankaran Nayar, K. P.	3
35	48	Sivaraman Nayar, P.	3
36	50	Sridharan Pandalai, K.	1
37	52	Srikrishnan, A. K.	2
38	53	Srinivasa Ayyar, M. K.	2
39	54	Vamadevan, N. K.	3
40	55	Varghese, M. P.	3
41	59	Vasudevan Nayar, K.	2
42	60	Viswanathan, G.	2

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